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COMPUTERWORLD

Seeing is believing for ACE plan

Products expected to roll out this summer

BY MARYFRAN JOHNSON
CW STAFF

Ever since the Advanced Computing Environment initiative made its flashy debut nine months ago, this alliance of competing vendors has seemed about as stable as a sand castle at high tide.

"Every time one of us hiccups, [someone says] ACE is falling apart," lamented Robert Miller, chief executive officer at Mips Computer Systems, Inc. and chairman of the ACE executive advisory board.

Users, meanwhile, are still wondering when all the hype about an ACE desktop standard for open computing will yield real products — and for which platform and operating system.

"When there's something close enough to see it, then I'll really believe it's going to work," said Warren Hoffman, principal consultant at Du Pont Information Systems in Wilmington, Del. "Anybody who starts making major decisions based on some joint arrangement is out of their mind."

From the original five key players in ACE — Microsoft Corp., Digital Equipment Corp.,

Continued on page 101

CA parries EDS with $2B suit

Suit claims software piracy, misuse have cost CA in lost fees

BY NELL MARGOLIS
CW STAFF

GARDEN CITY, N.Y. — Computer Associates International, Inc. last week fired off its reply to Electronic Data Systems Corp.'s recent lawsuit, accusing the outsourcing player of "massive, continuing" fraud, pirating CA's software and corrupting unsuspecting end users.

Among other offenses, CA claims that EDS distributed unlicensed and unpaid for — "i.e., pirated" — software to users at outsourced information systems shops, depriving CA of billions of dollars in rightfully earned fees. CA is seeking damages in excess of $2 billion.

In a separate $200 million suit filed in New York state court in Mineola, N.Y., CA also sued EDS parent and CA user General Motors Corp. on grounds of breach of contract and bad-faith dealing. This did not become apparent to CA until after EDS took over GM's IS functions. A GM spokesman said the company does not comment on matters in litigation.

Mum's the word

EDS also declined to comment, other than to reference its own lawsuit against CA and to call CA's damages estimate unrealistic. "Frivolous, even," an EDS spokesman said. "The $2 billion and up they say we owe them is substantially more than their annual revenues." The sum, he said, "seems strange, considering we do under $15 million a year" in business with CA.

"That's right," CA Executive Vice President Arnold Mazur said. "The rest is what they stole from us. That's what we want back."

The GM suit notwithstanding, Mazur said, the company does not intend to involve users in its quickly escalating battle with EDS, "except as absolutely necessary, as an integral part of defending our rights."

Calls for dismissal

CA has also moved for dismissal of EDS' suit — a multicount action charging CA with an array of bad-faith business dealings including monopoly and licensing fraud — based in part on EDS' failure to include as plaintiffs any of the users EDS claims CA injured. If the federal court denies that motion on the condition

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CW Chart: Michael Siggins

Merrill Lynch alters net to cut costs, speed data access

BY JOANIE M. WEXLER
CW STAFF

JERSEY CITY, N.J. — A site consolidation project under way at Merrill Lynch & Co. is allowing the brokerage firm to custom-build a local-area network infrastructure. The system will serve as a lightning rod for a companywide communications metamorphosis.

The firm has built a distributed networking foundation in its new 12-story quarters here as part of its transition from mainframe to LAN-based computing. The infrastructure's primary goal is to reduce systems turnaround time on frequent personnel moves, adds and changes by 75%, or from three weeks to less than one week, said Vincent A. Curatolo, vice president of distributed systems and services at the firm.

In addition, Curatolo said, a standard cabling plant and a 50% reduction in suppliers should reduce add, move and change costs from $2,000 each to less than $300, a savings that will pay back in less than a year the $1.1 million the firm has so far invested in network equipment at the site.

Shonna Valeska

Curatolo: *Firm will roll over investment in less than a year*

He explained that an up-front analysis suggested that moving 2,500 employees one at a time from two pricey New York City locations to the less expensive office space here — with no planned infrastructure — would have cost the firm $846,000.

The Jersey City site houses operations support and securities functions and will eventually include an alternate trading site.

Curatolo's charter over the next two years is to bring the Jersey City concept to Merrill Lynch's 13 other New York-area sites. This represents a

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Novell's integrated net scheme manages all

Graphics-based system allows users to collect data from multiple sources

BY ELISABETH HORWITT
CW STAFF

PROVO, Utah — Novell, Inc. is expected to leapfrog rivals Banyan Systems, Inc. and Microsoft Corp. this week by announcing an integrated network management platform that will manage Netware and just about anything else within a corporate local-area network installation.

Novell will announce Netware Management System, a graphics-based system that allows the network manager to centrally monitor real-time alerts and collect configuration information from multiple distributed LANs and servers, according to documents obtained by *Computerworld*.

Novell's system will reach beyond the Netware environment to give users insight into everything from the health of a hub card to CPU and disk use on a LAN server to the status of an uninterruptible power supply, according to Janet Hyland, director of network strategy research at Forrester Research, Inc., who was briefed last week by Novell. "The momentum is incredible," she added: Dozens of vendors have committed to supporting the system.

Compaq Computer Corp., for example, is already writing software to allow its servers to be managed by Novell's platform, the Novell document indicated.

SNMP compliance

The platform will also be able to manage Simple Network Management Protocol-compliant LAN systems, Hyland said.

Novell users said they were glad that Novell had gotten around to bringing out centralized management. Right now, they said, they spend too much time manually scanning Netware systems and still wind up playing catch-up with problems.

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Quotable

"We have no indication that our ability to make the date is in jeopardy at all."

JOSEPH GUGLIELMI
IBM PERSONAL SYSTEMS DIVISION

On the March shipment date for OS/2 2.0. See story page 6.

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"I TELL YA I'M STILL GETTING INTERFERENCE-
COOKIE ZEKE? ZEKE WANNA COOKIE?
-THERE IT GOES AGAIN!"

EXECUTIVE BRIEFING

■ **Merrill Lynch is installing a distributed networking system** in its new 12-floor quarters in Jersey City, N.J., as part of its transition from mainframe to LAN-based computing. The goal is to reduce systems turnaround time on frequent personnel moves, adds and changes by 75%, or from three weeks to less than one week, according to Vincent A. Curatolo, vice president of distributed systems and services at the firm. **Page 1.**

■ **Pattern processing, a technology used to identify patterns in operational data,** may be the strategic business strike of the future. By analyzing patterns of information on bad loans, for instance, Affiliated Bankshares of Colorado was able to cut its problem loans in half. At the core of this concept is an information warehouse in which IS places consistent, standardized, historical data extracted from different operational systems. **Page 73.**

■ **CA punches back** at EDS' recent lawsuit with a stinging countersuit, claiming EDS violated CA's licenses, pirated software and corrupted unwary users. **Page 1.**

■ **The '92 Winter Olympics** will be the most automated games ever. The Olympic Organizing Committee has overseen the installation of an intricate distributed computing network that links 15 sites. **Page 8.**

■ **IBM assumed the role of an American in Paris** after the French government let it buy into Groupe Bull for $100 million. The deal is expected to boost the Distributed Computing Model sanctioned by the OSF. **Page 4.**

■ **Storage Tek's Iceberg disk-array subsystem** is ready to enter the shipping lanes. The firm says it already has 140 orders — all the Icebergs it can make this year. **Page 100.**

■ **Job training programs only work if there are jobs,** which is what General Mills discovered. The firm discontinued a minority training program because shrinking profits and a shrinking work force left too few job openings. **Page 63.**

■ **OS/2 may be passing a milestone in user acceptance.** The operating system has begun to show up in an increasing number of mission-critical user applications. **Page 37.**

■ **For all of the talk about multiprocessing servers, a key piece may still be missing:** user interest. Some users say they have little interest in such servers, preferring that their vendors come up with cheaper systems. **Page 37.**

■ **There may be a snag in many users' strategies** for redundant networks. Some users now report that they can build redundancy into their networks, except for the last mile on the local loop. **Page 53.**

■ **Users in multiarchitecture systems operations** have a wish list for their vendors, and at the top of it is adoption of the OSF's Distributed Computing Environment. **Page 27.**

■ **Prime's decision to resell HP's Unix-based systems** as a replacement for Prime's own 50 Series machines was generally well-received by users and analysts. However, it came too late for some users. **Page 27.**

■ **On site this week:** North Carolina-based Merchants Distributors keeps a close eye on systems expenditures, saving cash by buying used hardware. **Page 29.** The Cleveland Clinic Cardiology Division decided to base an application on Windows 3.0 and found a way to learn Windows and build that major application in only two months. **Page 41.** FMC has decided to meld its voice and data communications, bringing that traffic in off of the public networks. **Page 56.**

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Bugs hinder Go's pen system release

BY JAMES DALY
CW STAFF

The latent pen-based computer market will remain grounded until at least the middle of the year, its lift-off hampered by a lack of deliverable hardware and further delays in the release of two key pen-based operating environments.

Several developers claimed a series of bugs will delay the arrival of Go Corp.'s Penpoint operating system until at least June, despite Go's assurances last week that Penpoint will enter its second beta-test phase this month and meet its end of March delivery date.

"It's still very buggy, and there are major things missing," one developer said recently. "I'm often surprised if it doesn't crash during a demo."

A Go spokeswoman said the company would meet its March deadline, adding that all beta-test versions have bugs.

Go can afford to delay its introduction as long as Windows for Pen Computing remains just a promise, analysts said. "Until Microsoft ships, Go is in no rush," said Bill Lempesis, editor of "Penvision News."

However, after missing at least three ship dates going back to June 1991, Microsoft Corp. will finally ship its competitor to Penpoint, Microsoft Windows for Pen Computing operating system extension, as part of Windows 3.1 at Comdex/Spring '92 in early April.

Even if the system software for pen computing ships on time, users will have one more hurdle to surmount. Both Penpoint and Windows for Pen will require at least an Intel Corp. 80386-based pen machine to run efficiently, analysts said, and that hardware is not expected to arrive until midyear.

Few deliverables

So far, the much-anticipated pen market has resulted in few deliverables. Grid Systems Corp. and Momenta Corp. have 386-based machines. Grid's proprietary Penright sits on top of DOS, while Momenta's system will recognize both DOS and Microsoft's Windows-based software when it arrives later this year.

Developers said they have been constrained by a lack of enough prototype pen tablets to test their applications. "We get the machines in 'oneseys' and 'twoseys,' so the progress is slow," a Penpoint developer said.

NCR Corp., Samsung Information Systems America, Inc., Trigem, Telepad Corp. and possibly IBM are expected to ship pen machines at that point. "Until the hardware ships, the operating system is pretty meaningless," Lempesis said.

Once the operating systems and the hardware platforms ship, developers can move ahead on other problem areas. Improvements in handwriting recognition, display technology, battery life, durability and pricing will evolve pen-based computers from vertical markets into broader horizontal business. By 1995, Framingham, Mass.-based market research firm International Data Corp. estimated, 850,000 pen systems will be sold per year.

Meanwhile, users who have been promised the moon have grown impatient.

"Our frustration is that we've been shown the capability of pen-based systems and have sold management on it, but now we want to go the next step and get our hands on the hardware and the operating systems," said William D. McHugh, principal methods analyst in the Newark, N.J., offices of the Public Service Electric and Gas Co. "We need products, not promises."

IBM seeks RISC boost via $100M Bull deal

BY KIM S. NASH
CW STAFF

PARIS — George Gershwin wasn't there to punctuate the moment with music, but IBM played the American in Paris last week when the French government let it buy into state-controlled Groupe Bull for $100 million.

Users and analysts expressed reservations as well as bon mots about the deal, which is expected to boost the Open Software Foundation (OSF)-sanctioned Distributed Computing Model (DCM), plug holes in each company's product lines and prop up Bull's precarious finances.

Technology, not financial details, appeared to be more important to users. While he said he was pleased with the proposed deal, Bill McCusker, former Bull User Society president, wondered how — and how quickly — the agreement would translate into products.

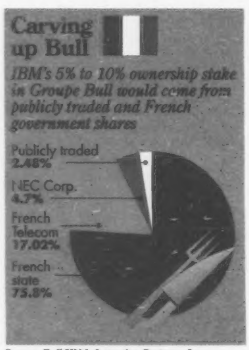
"Neither company is known for short time to market, and they're not stepping into a vacuum," he said, referring to reduced instruction set computing (RISC) rivals Sun Microsystems, Inc. and Hewlett-Packard Co.

The pact "sounds good for both companies, but it'll be a while yet before [users] get anything out of it," agreed Mary Ann Van, manager of data processing at Harbert Construction Co. in Birmingham, Ala.

Savvy RISC

Timing aside, other observers said, IBM has made a shrewd move. With Bull's large European installed base — said to be 30,000-strong for Unix servers alone — the pact makes it tougher for other RISC vendors to get a foot in the door, according to Andrew Allison, publisher of the "RISC Management Newsletter" in Carmel, Calif.

Meanwhile, Bull gains credibility, Allison said, echoing sentiments from several observers. The French company's reputation has suffered in recent years because of a string of losses and products perceived as dated.



Source: Bull HN Information Systems, Inc.
CW Chart: Michael Siggins

"This investment and the IBM name will make them look better," said Bob Jernstedt, vice president of information systems at X-Rite, Inc., an X-ray instruments maker and Bull 7000 user in Grand Rapids, Mich.

Bill Barner, manager of computer services at Copolymer Rubber and Chemical Co., home of two Bull mainframes, said a big reason IBM wants to work with Bull is to get access to the French vendor's "superb" multiprocessing technology for use in its RISC System/6000. "The deal is a good fit for both of them," he said.

Francis Lorentz, Bull's chairman and chief executive officer, and Michael Armstrong, chairman of IBM World Trade Corp., sketched their five-point plan, scheduled for action this year.

- **RISC.** Bull will adopt IBM's as yet undelivered Power Architecture and PowerPC Architecture, which it is developing with Apple Computer, Inc. Both companies will tweak their Unix products to make them more compatible with each other and with DCM.
- **Distributed computing.** The two firms will cross-license technology for hatching DCM-compatible hardware, software and networking gear. DCM is based on OSF standards and is Bull's blueprint for making Bull's proprietary GCOS 7, GCOS 8 and Unix environments talk to more popular systems, including machines running Microsoft Corp.'s Windows.
- **Portables.** IBM will sell portable and notebook computers from Zenith Data Systems, a Bull subsidiary (see story at right).
- **Manufacturing.** IBM and Bull will co-make and co-license multiprocessing Unix boxes and products for DCM with a potential value of "hundreds of millions of dollars," a vague estimate that officials refused to hone. IBM appeased France by agreeing to make RISC-based chips and hardware in two French plants.
- **Money.** IBM will pump $100 million into Bull for a 5% to 10% equity share in the company as "a token of our good faith," Armstrong said.

IBM offered more

"A RISC alliance for Bull was necessary. We cannot do it alone," said Gerard Roucairol, vice president of corporate research and advanced programs at Groupe Bull.

HP was also talking with Bull about a RISC deal, but "IBM presented a wider offer," according to a Bull spokesman. IBM agreed to exchange Unix technology with Bull and market Zenith Data's microcomputers — two points industry analysts said did not sit well with HP.

Some users noted that Bull's technical strengths give the company more leverage in its partnership with IBM, compared with Wang Laboratories, Inc., which eight months ago struck a marketing deal with IBM.

Portable push pumped

IBM's thus far feeble push into portables will likely reap some benefits from a plan to resell customized Zenith Data Systems portables, although analysts said the deal was just a bargaining chip in the broader overall discussions between IBM and Groupe Bull.

Despite a "memorandum of understanding" with Bull, which will provide IBM with Zenith Data portables to relabel, IBM will continue to push its own portable development. Its first notebook is expected Feb. 25 [CW, Jan. 27].

IBM said Zenith Data machines — its first OEM deal since it contracted with Matsushita Electric Industrial Co. for the Personal System/2 Model P70 in May 1989 — will fill out holes in its own product line. For instance, IBM has no plans to develop a machine based on the Intel Corp. 80386SL chip, reportedly focusing instead on its own derivative of the SX, the SLC, but could now offer Zenith Data's Mastersport SL.

For Zenith Data, the plan offers a chance to win back lost ground in the portable market. Despite regaining a technological edge in 1991 when it introduced five portable products, Zenith Data has seen its sales stall and has been unable to change its image as a government supplier. There is little overlap between the two companies. So IBM's corporate presence could boost Zenith Data's sales volume by giving IBM accounts a viable notebook computer from IBM.

IBM may be able to differentiate its relabeled portables from Zenith Data-logoed systems in two ways: Zenith Data will customize current and possibly future products for IBM; and IBM may be able to get volume pricing that will keep it competitive with Zenith Data.

"ZDS' image has been tarnished. They've lost the portable franchise they once owned, and I think the linkup will help build their installed base," said William F. Ablondi Jr., an analyst at BIS Strategic Decisions in Norwell, Mass.

At least one Zenith Data user, though, thinks buying Zenith Data laptops from IBM might be a good idea. "We have a better service agreement with IBM," said Barry Larsen, director of systems and data processing at Wisconsin's Department of Transportation.

IBM would not comment on how many units it might want, how they might be modified or the proposed length of the deal with Zenith Data, other than to say it expects to develop more than a short-term relationship with Zenith Data, separate from its Japanese-based portable design.

MICHAEL FITZGERALD

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Easy as 1-2-3? Not anymore

Spreadsheet advances could polish Lotus' image as technology innovator

BY ROSEMARY HAMILTON
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. is planning to unveil new spreadsheet technologies later this year, including the official debut of Improv for Windows, according to Jeffrey Beir, general manager of the spreadsheet division.

The company has plenty riding on these deliveries. Lotus last week reported fourth-quarter net earnings of $5.8 million on revenue of $249 million, due to restructuring charges. Moreover, Lotus continues to be plagued with the perception that it no longer has the edge in spreadsheet innovation and has lost market share to competitors.

Computer Intelligence's most recent PC Market Monitor survey showed Lotus with a three-month average market share of 47%, while Microsoft Corp. had 28%, and Borland International, Inc. had 9%. However, in September 1991, Lotus' three-month average share was 56%, while Microsoft's share was 20%, and Borland's was 16%.

"They need to be more proactive," said Cary Serif, manager of applied technology at Huntington Bancshares, Inc. in Columbus, Ohio. "They have rested on their laurels for a while and are now deciding to get back into the game."

Other users said they see Lotus as lagging behind its rivals with new spreadsheet functionality. "I don't know a lot about where they are headed, but they certainly need to do something," said Robert Grabowski, supervisor of end-user computing for the Texas region of Kaiser Permanente.

John Owens

Lotus' Manzi *doesn't deny a perception issue*

"I'm not disputing there's a perception issue," said Lotus Chairman Jim Manzi. He said that "being late to [the] Windows [market] was the source of some of it," but added that the company has a series of innovative responses coming.

However, some users said Lotus' ability to be top dog in spreadsheet features is not their primary concern.

"Spreadsheets are so loaded with features that aren't even used," said Ronan McGrath, vice president of information systems and accounting at Canadian Pacific Railways. "I think it's more of an issue of how [the applications] integrate with the desktop."

According to Lotus' Beir, the company has several spreadsheet advancements under way.

Some, such as Improv for Windows, will be announced later this year, he said. The financial analysis and modeling software was first built for the Next Computer, Inc. workstation platform and is considered a breakthrough in spreadsheet technology by many observers.

It allows users to work with financial data without the rows and columns restrictions of a spreadsheet. Beir said the 1-2-3 for Windows spreadsheet, which was introduced late last year to embarrassing reviews, will get a big boost this year. Release 2.0 is scheduled for delivery in mid-1992 and will include Lotus' first implementation of the much discussed Chronicle technology. Chronicle, which the company showed at Demo '92 last week, is group-enabling technology.

Beir said he would not provide details on Release 2.0 but said it will include more performance improvements as well as ease-of-use features. "There's the inclusion of what has become Windows standard ways, such as drag and drop, as well as some innovations from Lotus that make life easier," Beir said.

Before Release 2.0, Lotus will release a performance boost for the current Windows spreadsheet, Release 1.0A. Beir said Lotus has "breakthrough work coming in the area of performance," some of which will be provided in this point release, due later in the first quarter.

The OS/2 version of 1-2-3 will also get an update, Beir said. An announcement is planned around the time frame of IBM's release of OS/2 2.0.

Beir would not comment on a Lotus project, code-named Walden, that will reportedly focus on object-oriented technology for spreadsheets. However, he did say that work for Release 3.0 of 1-2-3 for Windows is "well under way, and that might help piece some things together."

Lotus' ability to meet this ambitious product rollout schedule is critical at this juncture, especially for Manzi. One industry observer recently went so far as to call for Manzi's resignation. In an open letter to Manzi, Stewart Alsop, editor of "P.C. Letter," said the chairman should resign because of a number of continuing problems at Lotus.

GUI watchers lay out predictions for 1992

BY JAMES DALY
CW STAFF

SAN JOSE, Calif. — The Windows & OS/2 Conference held here last week had few surprises either in new products or bold changes of strategy. The resulting lack of solid news sent many analysts scurrying to their crystal balls.

At a special session primarily designed to provide a forum to predict graphical user interface futures, there was much agreement that the greatest flap of 1992 will be the continuation of the war of words between the influential proprietors of two ghost operating systems: IBM's OS/2 2.0, the long-delayed update that is scheduled for general availability this quarter, and Windows New Technology (NT), which Microsoft Corp. expects to deliver by year's end.

A roundup of related forecasts follows:

- IBM will be a big loser if it misses its March 31 ship date for OS/2 2.0. Since Comdex/Spring '92 falls a week later, it would be left to make excuses rather than boasts to an estimated installed base of 800,000 users.

"The series of 'ifs' that hover around the head of OS/2 2.0 have to be resolved fairly soon," said Amy Wohl, president of the Wohl Associates research firm in Bala Cynwyd, Pa. "I won't believe in [OS/2 2.0] until I can bring it home, put on my machine and beat it up. I don't believe in demos."

- Microsoft has said Windows NT will ship by year's end, but users should not expect it until early or mid-1993. "NT is not a top priority," said Tim Bajarin, executive vice president of Creative Strategies Research International, Inc. in Santa Clara, Calif. "Microsoft is more than happy to make billions on Windows as long as it's still selling."

Meanwhile, look for Microsoft to get a lot of attention when it ships Windows 3.1, which is expected this quarter.

- Pen-based machines will come on strong by the middle of the decade, when prices are expected to hit as low as $1,000, Bajarin said. Additionally, the electronic stylus will serve as the foundation of systems ranging from travel reference companions that pop up on-screen electronic maps to portable offices equipped with faxes and modems.
- Hewlett-Packard Co.'s New Wave graphical environment will tumble beneath the onslaught of Windows, which Microsoft officials now claim has sold more than 9 million units. "New Wave will exist, but not as we know it now," said Jesse Berst, editor of the "Windows Watcher" newsletter. Berst said he expects HP to scale down and customize New Wave. Others expect it to evolve into a development tool.

Quattro left standing after technical shoot-out

Borland International, Inc.'s Quattro Pro for Windows, still in the beta-test phase, was the hands-down winner of a technical "shoot-out" between three Microsoft Windows spreadsheets at last week's Demo '92 exposition in Palm Springs, Calif.

The shoot-out comes at a time when many companies that have decided to standardize on the Windows platform are taking a hard look at their existing desktop productivity application standards. At some sites, the information systems department has been holding off on a Windows spreadsheet decision while waiting first for Lotus Development Corp. and now for Borland to ship their Windows spreadsheets.

Microsoft, of course, has already shipped Excel for Windows and is expected to ship Excel 4.0 shortly. Lotus shipped 1-2-3 for Windows last year and almost immediately had to rush out a bug fix. Wall Street is awaiting an anticipated sales explosion triggered by 1-2-3 for Windows. Quattro Pro for Windows reportedly will ship this quarter.

Contestants in the Demo '92 shoot-out included Quattro Pro for Windows, 1-2-3 for Windows and Excel 4.0. Borland and Microsoft were forced to use beta code, but it was the betas that took the day. A sound-activated approval meter was used to tally "votes."

Borland's "property inspector" feature, which allows users to click with the right-hand mouse button on an object to pull up a menu of options, and its dialog editor, which lets users create dialog boxes to control spreadsheets, were among the features best received by the audience.

Excel 4.0 garnered some kudos with its "direct manipulation" feature, which allows blocks of text to be simply dragged and dropped around a spreadsheet. An auto format button was also demonstrated.

Lotus did have one point in its favor — a point the demonstrator was quick to point out: 1-2-3 for Windows is the only one of the three that can be purchased at the moment.

OS/2 update

IBM is planning a big splash to roll out OS/2 2.0, but it will avoid going head-to-head with Microsoft in the desktop operating system wars, said Joseph Guglielmi, a vice president and general manager of marketing and business development for IBM's Personal Systems Division.

Microsoft plans to ship Windows 3.1 in early April, while IBM is still planning to get OS/2 2.0 out the door by the end of March.

"We have no indication that our ability to make the date is in jeopardy at all," he said.

According to Guglielmi, IBM should be shipping the last piece of beta code within a few weeks. This portion is the seamless Windows integration component that was not part of the Limited Availability release it shipped in late December.

ROSEMARY HAMILTON

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Fastest benchmark ever: 1,073 tpsB -Codd & Date

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Fastest benchmark on a VAXcluster: 425 tpsB -Codd & Date

Fastest benchmark on a VAX 6560: 153 tpsB -Codd & Date

Largest worldwide DEC VAX VMS RDBMS market share: 51% -Gartner Group

Fastest benchmark on an IBM-compatible mainframe: 416 tps -Codd & Date

Largest worldwide MS-DOS and OS/2 RDBMS market share: 41% -Gartner Group

Fastest benchmark on a UNIX minicomputer: 319 tpsB -Codd & Date

Largest worldwide UNIX RDBMS market share: 47% -Gartner Group

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NEWS SHORTS

TI's red ink will lead to pink slips

Texas Instruments, Inc. claimed that the combined impact of the U.S. recession, delays in a planned ramp-up of chip capacity and a $55 million onetime charge resulting from layoffs of 1,000 workers added up to less than zero for 1991's fiscal fourth quarter. Losses for the period increased 52% vs. the same quarter in 1990, from $56 million to $85 million. Sales slipped less than 1%, from $1.76 billion to $1.75 billion. A TI spokesman said another 1,000 jobs will be cut this year.

NCR, Teradata finalize plans

NCR Corp. and Teradata Corp. last week announced plans for product support and development after their proposed merger is finalized. Deliveries, enhancements and support will continue for NCR's System 3600 and Teradata's DBC/1012 systems, but a migration plan will "allow" customers to "evolve" to the massively parallel NCR 3700, which was jointly developed with Teradata and is slated for availability in 1993. A Teradata shareholder meeting has been set for Feb. 28. in Los Angeles.

Marketing is everything

Microsoft Corp. has begun a vigorous Windows marketing campaign, asking personal computer and peripheral makers to display the Windows logo in their advertisements, product packaging and even on the machines. Two logos — one indicating that the machines meet the technical criteria necessary for Windows and another meaning Windows has been preinstalled — are scheduled to be seen on products from Dell Computer Corp., Tandy Corp. and Digital Equipment Corp. Chipmaker Intel Corp. launched a similar plan last July.

J. P. Morgan taps BT outsourcing

Under a five-year, $20 million contract announced last week, J. P. Morgan & Co. will outsource its overseas terminal-to-host data network to BT North America, Inc.'s Global Network Services. The move is expected to save the financial services firm $12.5 million in operating expenses over that period, primarily through paying on a usage basis rather than setting monthly rates for dedicated lines, a J. P. Morgan spokesman said. The network will support 26 sites in 14 countries.

Systemhouse gets its share

An Ottawa-based outsourcing contender last week bagged its biggest deal to date: A $100 million-plus, seven-year package of contracts under which Systemhouse Ltd. will take over all information systems operations for both the provincial government of Nova Scotia and privately held telecommunications firm Maritime Telegraph & Telephone Co.

Masi moves on again

Unisys Corp. may pull out a profit in 1992, but it will do so without J. Carl Masi, the company's vice president of corporate marketing. Last week, Masi resigned "to pursue other interests," Unisys said. Clive Ingham, a longtime Unisys veteran, replaces Masi. Prior to his two-year stint at Unisys, Masi was in business for himself. Before that, he spent one year as chairman and chief executive officer of International Data Corp. in Framingham, Mass., after leaving Wang Laboratories, Inc.

Microsoft's Oki to step down

Scott Oki, senior vice president of Microsoft's U.S. Sales, Marketing and Service Divisions, will retire on March 1. He will be replaced by Jeff Raikes, currently vice president of the Office Systems Group. Under the direction of the 43-year-old Oki, Microsoft's U.S. business grew from $69 million when he took over in 1986 to $571 million at the end of fiscal 1991. The 10-year Microsoft veteran said he plans to spend more time with his wife and two children and direct the Oki Foundation, a personal philanthropic organization. Raikes, 33, has logged 11 years at Microsoft.

More news shorts on page 100

A gold medal for automation

The Olympics relies on complex network to track and support its games

BY MICHAEL ALEXANDER
CW STAFF

ALBERTVILLE, France — The last time anyone mounted an operation of this scale in the Alps was more than 2,000 years ago when Hannibal's army drove a herd of elephants over the mountains in the dead of winter.

The 1992 Winter Olympics, which kick off Saturday in Albertville and its environs in the French Alps, will be the most automated Olympics ever, according to Benoit de Chassey, director of information systems for the Organizing Committee of the 16th Winter Games. "Without computer systems to match the complexity of today's Olympics, there would be no Olympics," de Chassey claimed.

The committee, in collaboration with Andersen Consulting, has assembled an intricate network that includes 10 Token Rings and 1,800 IBM Personal System/2s (Models 55, 70 and 80) distributed among 15 sites scattered over 700 square miles of mountainous terrain.

The system, called Info92, will allow about 45,000 committee members, volunteers, journalists and other accredited users to retrieve up-to-the-minute scores, weather forecasts and bus schedules and correspond by electronic mail, using IBM's Officevision/MVS, according to de Chassey.

The personal computers are connected to servers running OS/2 LAN Server; the servers are in turn linked via LU 6.2 communications protocols to an IBM 3090 mainframe. An Application System/400 is also linked to the mainframe.

In addition to warehousing data about past Olympic events and participants, one IBM mainframe will relay athletes' scores, racing times and other data in real time via dedicated Integrated Services Digital Network lines provided by France Telecom, Inc. to television broadcasters housed at the International Broadcast Center in Moutiers, France.

The second IBM mainframe will serve as a backup to ensure that broadcasters have results within five minutes of any glitch that occurs in the first mainframe, de Chassey said.

The committee will use the AS/400 for its financial and other business chores and act as a front end to one mainframe for E-mail via IBM's international mail network, de Chassey added.

CBS, Inc. has installed a local-area network in a temporary data center in Moutiers to support its 700-person CBS Sports broadcast team. The TV network, which plans to broadcast 116 hours of coverage of the athletic showcase, has also linked its data center in France to its Black Rock headquarters in New York with 56 16K bit/sec. compressed voice channels and seven 56K bit/sec. data lines.

The LAN is built around three Northgate Computer Systems, Inc. file servers running Novell, Inc.'s Netware 386 and a mix of 100 Intel Corp. 80386-based Northgate and Compaq Computer Corp. PCs. A smaller LAN, installed at CBS in New York, will handle backup duties "in addition to talking to several of the other LANs in CBS news divisions and so on," said Rick Cusworth, manager of computer systems at CBS' Olympics unit.

The LANs were installed by Nesbit Systems, Inc., a systems integrator based in Princeton, N.J., and will run a variety of software, including applications designed especially for broadcasters (see story below).

The 56 voice and seven data channels will be used "to run the day-to-day business," said Tom Maile, vice president of telecommunications at CBS. The voice and data circuits are being leased from MCI Communications Corp. and make extensive use of Newbridge Networks Corp.'s digital multiplexers and router/bridges.

"When we started the planning on the Olympic voice and data requirements, we turned to MCI and Newbridge to see what could be tied with our existing domestic data network — to get inexpensive dial tone — and integrate it into our [MCI] virtual private network that supports all of the CBS locations," he said. As a result, the 56 voice channels permit international dialing using only seven digits and at a rate of 20 to 30 cents per minute, less than half what it would ordinarily cost, Maile said.

The cost of the entire project "is in the million dollar range when you put everything together," Cusworth said. "It is an exceedingly expensive venture, not the least of which is the fact that we have had to rent a lot of the equipment and had to have local vendors install all of the cabling."

Heinz Kluetmeier/Sports Illustrated

Olympic hopeful Kristi Yamaguchi's *performance will be broadcast with help of the Games' powerful network*

The Big Remote

Nesbit Systems, a systems integrator based in Princeton, N.J., specializes in developing systems and software for the television broadcast industry.

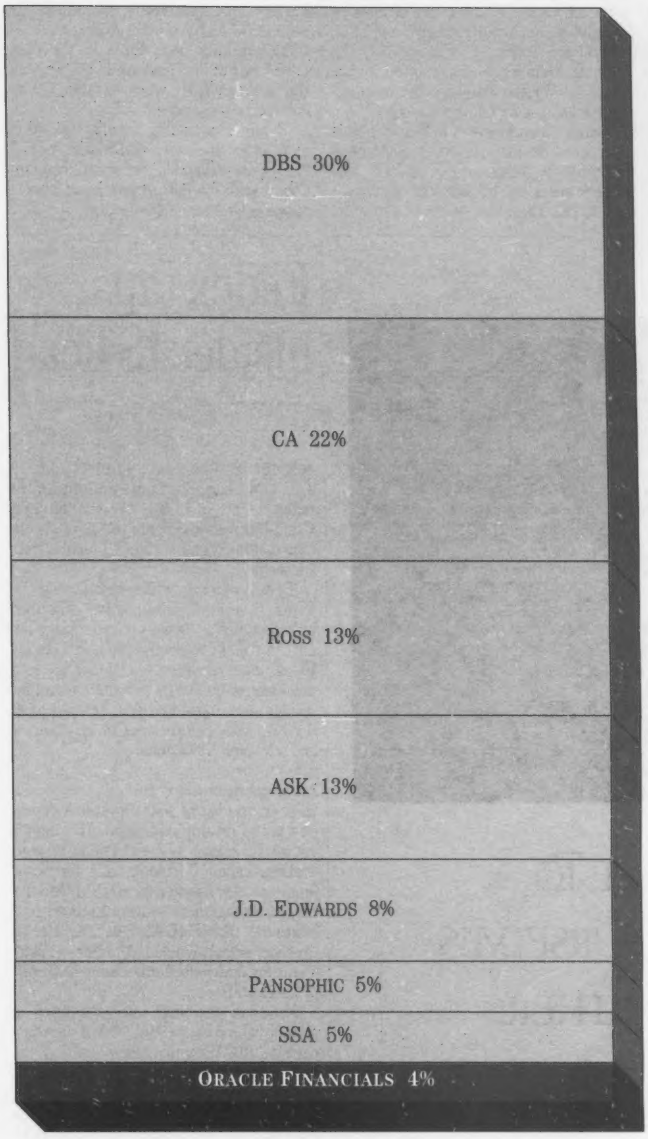
The computer network operated by CBS Sports will run a package of applications called The Big Remote, which Nesbit developed especially for broadcasters covering events from remote sites, said Irene Nesbit, company president.

The Nesbit software includes a videotape library system that will be used to keep track of approximately 10,000 videotapes and to catalog information about the footage the tapes contain, Nesbit said. Other Big Remote applications track equipment, finances and logistical concerns. The company provided a similar system to NBC for its coverage of the Summer Olympics in Seoul, South Korea, in 1988.

The LAN will also run several third-party applications, including E-mail, word processing and spreadsheet programs.

MICHAEL ALEXANDER

THE FINANCIAL SOFTWARE MARKET HAS JUST BEEN TURNED UPSIDE DOWN.



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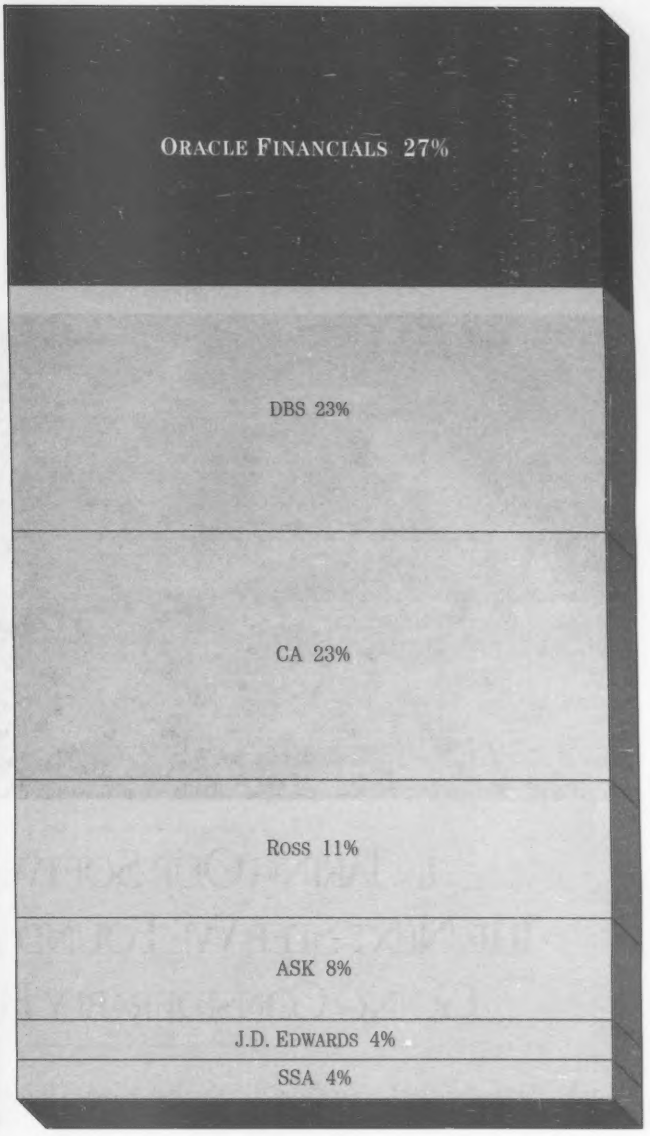

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Testing moves Oracle 7.0 debut to late summer

BY JEAN S. BOZMAN
CW STAFF

BURLINGAME, Calif. — The next release of Oracle Corp.'s core database management system will not be generally available until late summer — roughly a year after users expected it.

The delay of Version 7.0 was attributed to extensive testing at Oracle and at beta-test sites and has forced many users to develop workarounds, according to users in the International Oracle Users Group (IOUG). The system was demonstrated at an IOUG meeting in 1989.

"We've decided to announce it in April and to release it at the end of the summer," Oracle Chief Executive Officer Lawrence Ellison said at a recent analysts meeting. Shipment of Version 7.0 is critical, Ellison said, because it will prevent Oracle competitors, such as Sybase, Inc., from claiming technological superiority.

In the past, Sybase and others have claimed to have technological superiority over Oracle in areas such as triggers, referential integrity, stored procedures and two-phase commit. "Those [product] differentiators are all gone [with System 7.0] — every last one of them," Ellison said.

The delay of Version 7.0 will have minimal impact on users because less than half of Oracle's installed base has upgraded to the last iteration of the DBMS, analysts said. "Most customers will not even upgrade to Version 7.0 for quite a while," said Charles Phillips, a senior analyst at Soundview Financial/Gartner Group, Inc. in Stamford, Conn.

Some users were disappointed by the additional Version 7.0 wait, but most accepted the need for extended testing.

Complexities inherent in Version 7.0's distributed database features could pose reliability problems, they pointed out. "There are a lot of potential gotchas," said IOUG President Michael Corey, a Boston information systems manager.

"My opinion is that a majority of the Oracle users are willing to wait," added Geoff Girvin, an IOUG vice president. "They would prefer to have good code rather than sloppy code."

Girvin said some users have already begun to write applications to leverage Version 7.0's stored procedures. "A number of us have built dummy systems that store our procedures in the database," he noted. Those users will activate the new functions when Version 7.0 arrives, Girvin explained.

Behind the scenes, as many as 20 or more user sites will soon install Version 7.0 in an expanded beta-test program, Corey said. To date, there have been a handful of Version 7.0 beta sites.

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Fedex taps insider IS head

BY CLINTON WILDER
CW STAFF

MEMPHIS — At a time when its mission-critical package-tracking system is in the midst of an overhaul, Federal Express Corp. has moved quickly to fill its vacant information systems chief's position from the inside.

Fedex recently promoted Dennis H. Jones, a veteran IS executive described by colleagues as "low-key," to replace departed top IS executive Ron J. Ponder. Jones, who reported to Ponder as vice president of customer automation and invoicing, was named to Ponder's old position, senior vice president of information and telecommunications.

Next generation

High on the list of Jones' systems priorities is the revamp of Cosmos II, Fedex's vaunted tracking system. The next generation, called Cosmos², calls for some functions now handled by an IBM IMS database management system to move to a relational DBMS [CW, Feb. 11, 1991]. Cosmos² will also include Unix-based platforms for distributed processing at Fedex dispatch stations.

Fedex is one year into the 3½-year project, which uses about 100 of the company's 2,000 IS employees.

Like Ponder before him, Jones is responsible for all software development, computer operations and telecommunications support. He controls an IS budget of about $240 million.

Ponder, Fedex's top IS executive since 1982, left in November to become chief information officer at U.S. Sprint Communications Co./United Telecommunications, Inc. [CW, Nov. 25, 1991].

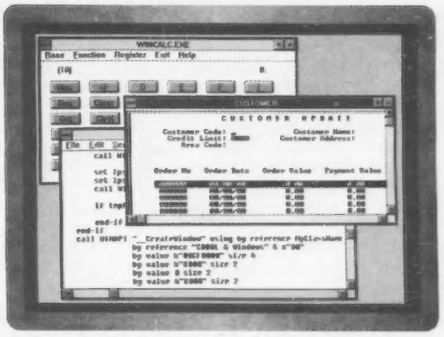
Jones, a 16-year Fedex employee and a Memphis native, had headed customer automation and invoicing since 1986. He will continue to be in charge of that function, as well as strategic IS processing and systems engineering.

Jones joined the transportation company in 1975 as a senior financial analyst, and he has held various management positions, ranging from manager to director, in the IS area. He holds bachelor's and master's degrees from Memphis State University.

Jones was traveling last week and was therefore unavailable for comment.

Why is Micro Focus Saving So Many People So Much Money?

Graphical User Interfaces?



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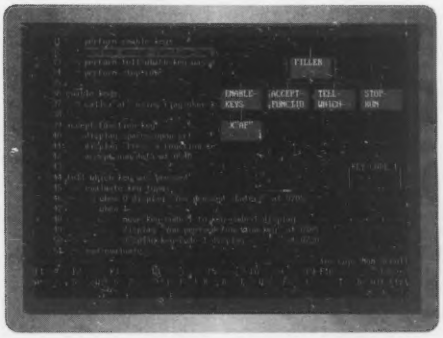

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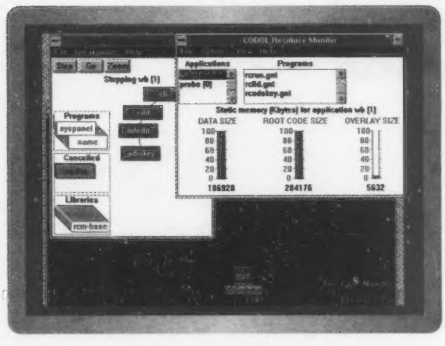

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Compaq rebuilds after '91 income drops 71%

BY CAROL HILDEBRAND
CW STAFF

HOUSTON — After enjoying unbroken seasons in the sun of annual increased earnings, Compaq Computer Corp.'s spring, fall and winter of discontent closed last week with the company's first-ever annual decline in earnings.

Chief Executive Officer Eckhard Pfeiffer, brought in to turn the company into a nimbler, more price-conscious competitor, said he thinks most of the groundwork has been laid. This year will see Compaq responding with a four-layered product attack that includes entry-level desktop boxes and notebooks at a much lower price point, continued introductions of the company's traditional high-performance personal computers and a range of servers.

"A lot is already under way," Pfeiffer said, citing recent layoffs and management restructuring as the major reorganizational issues. "Such change can provide freedom to do what's right."

Pfeiffer pointed to the introduction of the new LTE notebooks, on schedule in spite of the company's turmoil, as well as increased fourth-quarter unit output as an indication that Compaq is back on track.

He also said the restructuring would hand total regional responsibility to regional directors and empower them to react more swiftly to the market. Although he did not discuss pricing changes, he did say the company was working on that issue.

However, analysts are not forecasting a Cinderella turnaround for the beleaguered company. Bruce Stephen, an analyst at International Data Corp., a research company in Framingham, Mass., said fourth-quarter earnings were pretty much in line with what he expected and added that he is looking for a flat year fiscally from Compaq in 1992.

This year "will be a real rebuilding year," Stephen said. "They're moving to create whole new lines of business on the low end, and they have learning and funding curves to go through."

Others pointed to Compaq's international sales, which accounted for 59% of the company's revenue, as an indicator that a moribund domestic market is taking its toll.

Net income for Compaq in 1991 was $131 million, a 71% decrease from the $455 million reported for 1990. Income from the fourth quarter dipped 51% from the same period a year ago to $67 million.

And miles to go

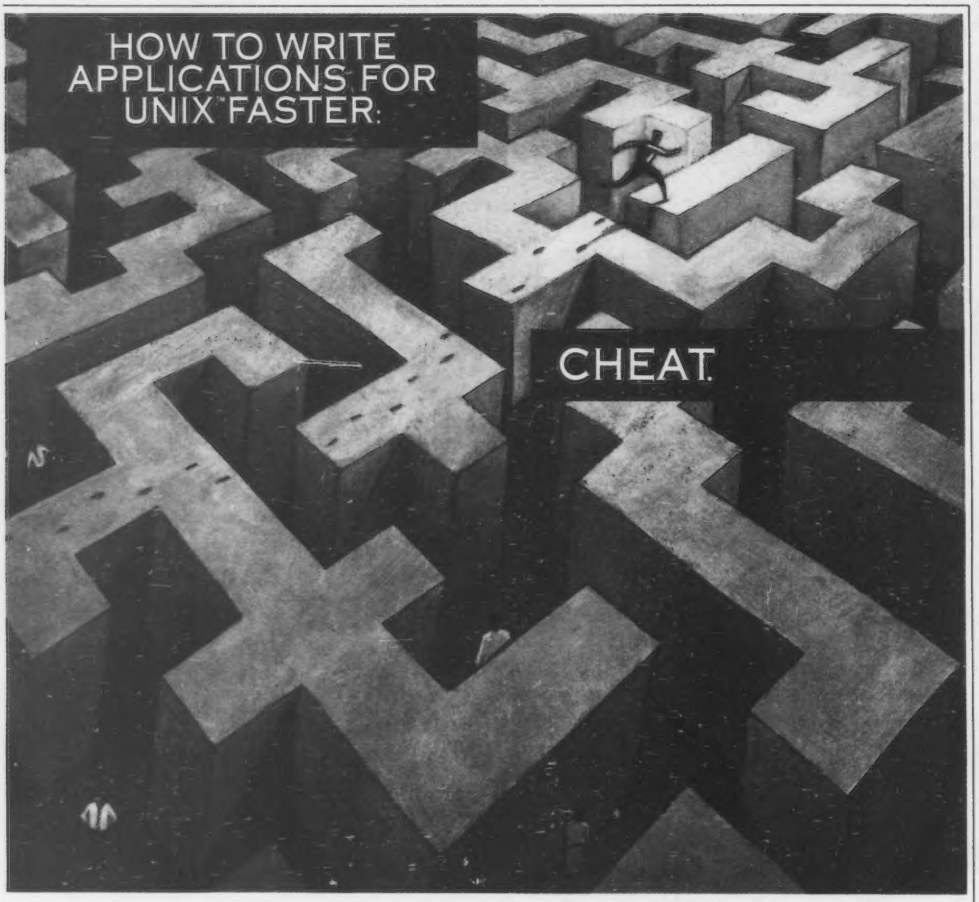
Compaq's restructuring leaves it with a long row to hoe fiscally

1991 Compaq fiscal year ending in December

	REVENUE	INCOME
Q1	$970.8M	$114.3M
Q2	$717.8M	$20.3M
Q3	$709.4M	$(70.3M)*
Q4	$873.4M	$66.6M

*Loss due to restructuring charge

CW Chart: Janell Genovese



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AMD to clone Intel's I486 CPU

BY MICHAEL FITZGERALD
CW STAFF

SUNNYVALE, Calif. — Like a surfer going after a good wave — in this case, corporations moving to standardize on I486-based personal computers — Advanced Micro Devices, Inc. (AMD) plans to enter the Intel Corp. 486 microprocessor clone market later this year.

AMD will not ship its Am486 chips in volume until the fourth quarter of 1992. The chip maker said it announced the chips early to end speculation on its plans.

On tap now is a 33-MHz 386SX clone.

Most analysts said they expect the company to provide a solid alternative to Intel. "I don't think there's any question of their getting acceptance," said Richard Zwetchkenbaum, senior hardware analyst at International Data Corp. in Framingham, Mass. He added that Compaq Computer Corp. and other companies want a second source for chips.

Users were split on the chips.

"I've used machines with chips besides Intel's — they work," said Howard Gielow, director of corporate information resource management at Brunswick Corp. in Skokie, Ill. "If AMD-based machines are certified by Novell, I wouldn't mind using them."

Still, Paul Mitnick, head of information systems at The Equity Group Investments, Inc. in Chicago, said he would look at AMD-based machines if the price was low enough but would be "leery" of buying them.

AMD intends to offer 25-, 33- and 50-MHz versions of its Am486DX, pin-compatible with Intel's 486, and a 25-MHz Am486SX chip that will ship in both surface-mount and pin-compatible versions.

Also in the fourth quarter, AMD will ship engineering samples of its low-power 486s, with clock speeds of 16-, 20- and 25 MHz.

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HEWLETT PACKARD

CA countersues EDS, charges pirating, license violations

CONTINUED FROM PAGE 1

that users join EDS' complaint, Mazur noted, "customers [may] indeed find themselves in the middle of this, and it will be EDS, not CA, that put them there."

Users showed little fear of finding themselves in court as a result of the EDS/CA wars, but some were less sanguine about their chances of going unharmed on the business front.

"Absolutely, I resent being put in the middle," said John Livingston, chief information officer at National Car Rental, Inc. in Minneapolis, a huge CA user site under an outsourcing contract to EDS since early 1991. "But the bigger issue is, what happens with your software licenses when an outsourcer takes over? This whole issue is now in dispute. We don't know when it's going to be resolved, and we don't know how it's going to be resolved."

Mazur emphatically stated that last week's suit is not the opening salvo in a CA war on the outsourcing arena. "Yes, the abuses we cite have grown with EDS' outsourcing business," he said, "but our differences are with nobody but EDS."

Arthur Gillis, president of New Orleans-based management consulting firm Computer Based Solutions, Inc., said he doubted the fur flying between CA and EDS would clog the gears of the accelerating outsourcing market.

"This isn't disastrous for users — either outsourcers or outsourced," he said. "Nobody's going to shut them down."

User reaction in the wake of CA's suits bore out his assessment. "I feel no qualms at all about dealing with EDS," said Laurence Liss, senior vice president of operations and technology at Philadelphia-based Meritor Financial Group. Meritor outsourced to EDS in 1989.

Users, however, "will suffer from key [players'] attention being deflected from critical activities — development, management, strategy," said Gillis, whose consulting practice specializes in bank outsourcing. "I've seen impressive systems guys sitting in a lawyer's office with their beepers going off like crazy, and I'm thinking, 'Will somebody please tell me how in heck this is helping the bank?' "

According to several executives, CA intends to maintain the same stance in its legal war as it does in software pricing: tough but fair. "We're not taking pot shots, and we're not picking on . . . mistakes or technicalities," said CA general counsel Belden Frease. CA has — and extensively cites in its pleadings — names, dates and serial numbers to back its claims that EDS flagrantly disregarded the express terms of CA licenses in place at user sites it outsourced, Mazur said.

CA was alerted to the possibility that skulduggery was afoot by EDS-supplied documents and documentary discrepancies that emerged during a routine investigation into an accounts payable dispute with EDS several years ago, Mazur said.

Sun 2nd-quarter revenue up 20%

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. last week reported healthy revenue growth of more than 20% in its second fiscal quarter, thanks to what company officials said was strong demand in the commercial marketplace and initial acceptance of the Sparcserver 600MP series of multiprocessing systems.

Since the September introduction of the high-end server, Sun said it has shipped more than 2,600 units, including systems and upgrades.

The workstation vendor posted $909.1 million in revenue for the quarter — up from the $753.5 million for the corresponding period in fiscal 1991. Revenue per employee over the past year reached $279,000, among the highest in the industry.

Sun officials were cautious, however, about their continued good fortune in the face of economic uncertainties. "Competition continues to intensify, and the company will need to manage important hardware and software transitions during calendar year 1992," said Kevin Melia, Sun's chief financial officer.

Melia was referring to the midyear introduction of the Sparcstation 3 line and the debut of Solaris 2.0, a new version of the Sun operating system that will run on both Sun and Intel Corp. platforms.

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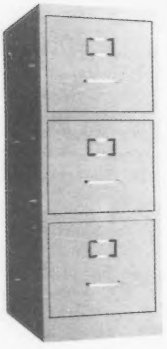

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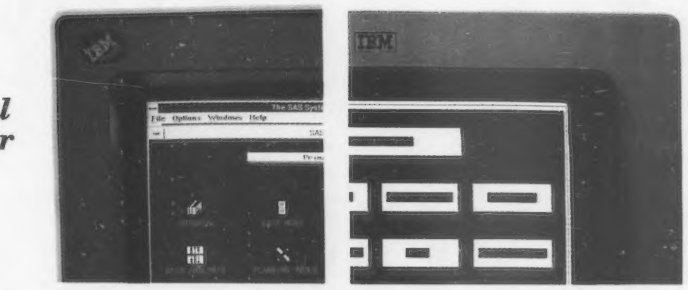

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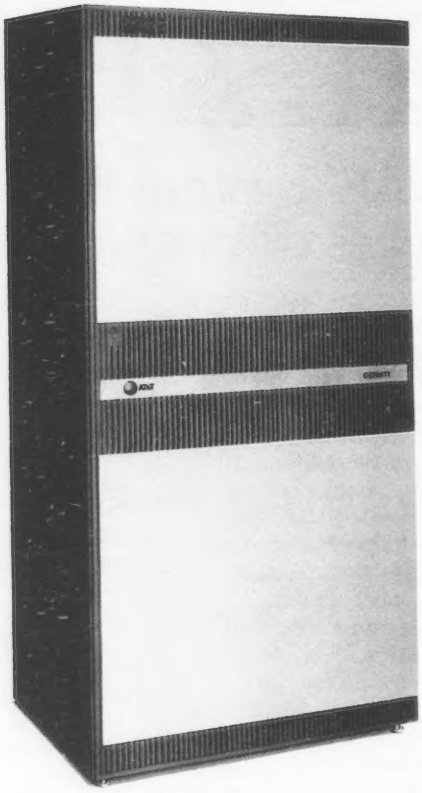

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ADVANCED TECHNOLOGY

TECH TALK

Colorful computer chip

■ Oak Technology, Inc. has introduced a chip that the company said could boost the graphics performance of computers running applications under Microsoft Corp.'s Windows. The new device achieves much of its speed by communicating directly to an Intel Corp. 80386 or I486 microprocessor via the high-speed local bus instead of the slower AT bus or Industry Standard Architecture bus used by IBM Video Graphics Array (VGA) chips. The chip is compatible with thousands of MS-DOS programs and can improve the performance of computers running those programs five times faster than VGA chips, the firm said.

No pains to strains

■ A "holostrain system" developed at the Illinois Institute of Technology in Chicago will soon enable civil engineers and others to detect stress points in engines, airplanes, bridges and other structures. The system, a hybrid of personal computer, holographic and video technologies, pinpoints the "strains" of a structure in only minutes, according to Cesar Sciammarella, chief researcher for the project. NASA said it will use the holostrain to analyze its next-generation space vehicle. The system will cost $30,000 to $100,000.

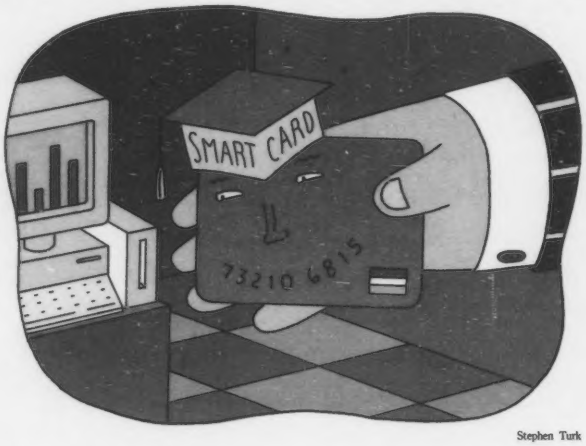
New TV chip set

■ Fujitsu Ltd., Hitachi Ltd., Sony Corp. and Texas Instruments Japan Ltd. have collaborated on the development of a second-generation chip set for high-definition television (HDTV) decoders. The four companies plan to ship engineering samples of the chip set this month and commercial samples beginning in April. The chip set will be used to construct a signal demodulator for reception of HDTV broadcasts in Japan. Formerly, decoders required about 150 integrated circuit devices; the new chip set makes it possible to build a decoder using 30 devices.

Smart cards the better way to pay

After a 10-year struggle for acceptance, smart cards are finally getting respect

BY MICHAEL ALEXANDER
CW STAFF



Stephen Turk

The Regional Transportation Authority (RTA) of Northeastern Illinois plans to kick off a fare system in March that will enable 20,000 "mobility-limited" passengers — as the RTA calls them — to use smart cards for identification and to pay their fares.

The smart cards will allow the RTA to keep a more accurate accounting of trips taken each year in lift-equipped vans and other special vehicles operated by privately owned carriers. The RTA spends more than $20 million a year on paratransit services in the Chicago area.

The vehicles will be equipped with smart-card readers that will note the passenger's identity, the date and time of the ride and deduct the fare from the card's "electronic purse." At the end of the day, the carrier will use a portable terminal to upload transfer records to a local-area network, where payment due to the carrier will be calculated.

Searching for acceptance

For all of their brainy qualities, smart cards have struggled unsuccessfully for more than 10 years to find widespread acceptance in the U.S. That may finally change over the next few years for several reasons, according to proponents of the technology.

Several visible pilot programs are nearing launch or are already under way. There is mounting concern in business about credit card fraud, computer tampering by outsiders and other crimes that may be prevented by the use of smart cards. And the smart-card industry may be finally becoming more businesslike, said some smart-card experts.

"We're probably at the stage where it is legitimate to say smart-card prosperity is around the corner," said Ben Miller, publisher and editor of "Personal Identification News," a newsletter covering smart cards and security technologies. "We're digging out from the unrealistic claims and the hypsters and are more oriented seriously toward the business."

A smart card has the same general dimensions as a credit card and often has the same embossed lettering on the front and the familiar magnetic strip on the back. However, embedded in the card are a memory chip, microprocessor and other circuitry.

Smart cards are more secure than conventional credit cards because the magnetic strip on a credit card can be readily copied, said Peter Ognibene, vice president of corporate development at Applied Systems Institute, Inc. (ASI). ASI specializes in developing smart-card applications and is the contractor on the Chicago RTA project.

The cards vary in sophistication from ones with 1K to 2K bytes of memory and little else to 8K bytes of memory and a microprocessor. The cost of a card ranges from $1.50 to $15.

Several million smart cards are in circulation in Europe and Japan and are used to carry the electronic equivalent of small amounts of money for pay phones and parking meters. However, in the U.S., where there are about 1 million cards in use, smart cards are used mainly in pilot programs.

"Now, a lot of those applications are moving from the pilot stage forward," said Pete Fallon, chairman of The Smart Card Industry Association in Washington, D.C.

Several federal government agencies have resumed experimenting with smart cards in a variety of ways after slacking off for a few years, Fallon said. As a result of the Gulf War, the military is exploring the possibility of putting personnel data on cards, for example.

Cards that are smarter than smart

Optical cards, which do not use electronics, are in some ways more intelligent than smart cards. The optical card made by Drexler Technology Corp., which invented the technology, has a capacity of 2.86M bytes, equal to 1,200 typewritten pages.

The card consists of a wide, reflective optical recording stripe encased between transparent layers. Information is stored digitally on the card in binary code represented by either the presence or absence of microscopic spots on the recording stripe. Data is recorded on and retrieved from the card by a low-powered laser mounted inside a reader/writer connected to a personal computer.

Medical researchers at the University of Wisconsin devoted three years to developing a technique to record X-ray and magnetic resonance images directly onto optical cards without using film. The goal of the project, underwritten by the U.S. Department of Defense, was to develop a portable patient medical record.

"The concept of optical cards is wonderful," said Melvin Siedband, professor of medical physics at the university. "The big problems were the reading and writing speeds." It would take several minutes to scan and retrieve a single image, Siedband said.

"The basic card technology is not a lot different than an optical disc," Siedband said. "However, optical discs have writing and read rates 20 to 50 times faster than optical cards" for images.

The card costs between $1 and $10, depending on the quantity purchased, Siedband said.

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MICHAEL ALEXANDER

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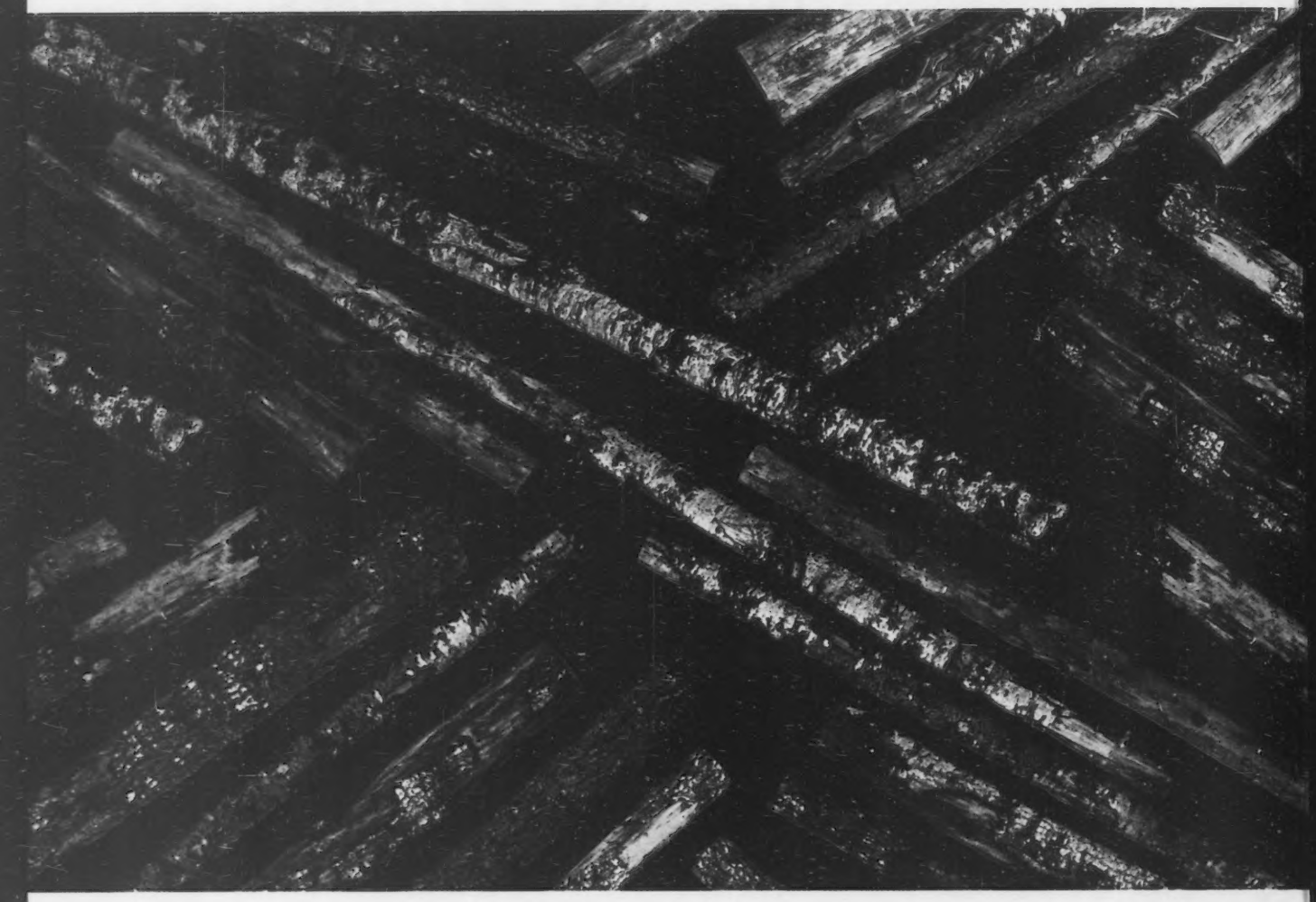

If development's at a stand

In two or three years your company will have changed, your markets will be different, your competitors will be using new tactics, and the applications you needed today might be ready.

So it goes with software development. Most large projects are backed up so long, by the time an application is new, it's old. Worse, it may not even be what was asked for in the first place.

This dilemma is anything but acceptable, so IBM has launched a major effort to speed things up. Working with leaders in CASE technology, we're building a new framework called AD/Cycle™ that's giving the entire development cycle something it never had before;

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still, how fast can the rest of your business go?

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Over 60 AD/Cycle products are available today, and scores of CASE vendors have signed up for AD/Cycle. Which means it's already gaining acceptance as a standard for application development, and much more is on the way.

Companies like Eastman Kodak, Phillips Petroleum, USAA and Continuum are now using AD/Cycle tools with good results. Clearly, the sooner you get started the better, and there's plenty to start with now.

The roots of today's backlogs are many, but the biggest culprits have been a lack of standards and direction—the very ills that AD/Cycle is designed to cure.

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EDITORIAL

Vicious cycle

The Repository Manager loses yet another battle this week as a lead developer on IBM's strategic applications development platform bolts, reportedly for a job at Sun.

Is it too early to declare the Repository Manager dead in the water? If it isn't, then IBM must have the bilge pumps turned on full blast. Of the handful of sites we can find that are actually using Repository Manager/MVS, few are enthusiastic. User attitudes toward Repository have gone from curious to skeptical to downright sarcastic in frighteningly little time. There may be nothing IBM can do to save the project at this point.

The whole strategy has been a disaster on several fronts. Six months before Repository was announced as the keystone of the AD/Cycle development strategy, IBM was out pumping it up with advance publicity and executive interviews. But what it announced in September 1989 was short on news about delivery dates, platforms and information models — not the kind of corners you cut when you're talking to customers about a strategic corporate resource.

Since then, IBM's track record on deliveries has been miserable. The first version of Repository Manager/MVS was so skeletal it was nearly unusable. The second version isn't even out yet. Users are still waiting for a coherent LAN or PC strategy for applications development. And it hasn't helped that two of the four companies that make up IBM's inner circle of AD/Cycle development partners have experienced severe financial troubles in the last year.

Clearly, users are no longer interested in grand-plan architectural statements that aren't followed by fast and frequent product shipments. IBM appears to be the last to realize this, judging by its penchant for grand-plan strategies. It's also apparent that any strategy that doesn't emanate from the desktop and work its way up is going to bomb. It is arrogant of IBM to continue to make an MVS mainframe the base requirement for users who want to experiment with Repository. It ignores the fact that IS departments are moving development off the mainframe as quickly as they can and that the last thing they need is another big clump of host software.

There is obviously a market for a repository concept, as evidenced by the success several CASE vendors have had selling smaller, simpler products. IBM's big mistake was riding onto the scene in the self-proclaimed role of master integrator of everybody's approach. In swinging for the fences, it got tangled up in its own feet right at home plate. There it will remain until it can get a product out the door that allows users to approach repository management in stages and recognizes that in the real world, software development rarely conforms to a master blueprint. Unfortunately, events such as this week's defection make that possibility less and less likely.

Paul Gillin, *Executive Editor*

LETTERS TO THE EDITOR

Japanese cars and crime-filled cities

In your editorial "Don't quota me" [CW, Jan. 13], you expressed free trade and antiquota views that I also once supported. However, after looking at what has become of our country in just a decade, it is time to rethink that position.

Yes, the auto industry executives showed excessive greed and bad management. However, the individuals out of work did not design, market or engineer the products. It has turned out that management, not the worker, was the problem. The individual who is being taught a lesson is not the villain but the common worker.

Approximately half the cars I have bought have been Japanese. As I look at the social cost and unraveling of an entire society, even a Corvair is beginning to look good to me. Driving a sleek Japanese car in a city filled with crime is not pleasurable — nor is it a fair trade-off any longer.

More importantly, the U.S. imported more computer technology in December 1991 than it exported. A trend has started. The Japanese had not, until the president's trip, allowed U.S. computers into their government offices at all. Many U.S. companies, such as IBM, now have more non-U.S. employees than U.S. employees. The U.S. electronics industry is declining at 3% per year, and at that rate, it will cease to exist in another 10 years.

Major corporations are now exporting programming jobs to India, where it costs only $50 per week to employ a Ph.D. That is what we did with our manufacturing jobs: a quick savings followed by decades of economic decline. Our workers' wages have declined from first to 13th in a single decade.

Your view has been bought and paid for. Japanese auto companies made more campaign contributions in the last presidential election than Chrysler, Ford, General Motors and the United Auto Workers Union combined.

This is not bashing. They did things better than we did. But they also played by a different set of rules. Let's play fair but not stupid!

John W. Hill
Info System Architects
Dickinson, Texas

Not necessarily a lack of expertise

Regarding "Poor communication equals vaporware" [CW, Jan. 13], I was glad to see *Computerworld* focus attention on the problems software developers and IS folks have when their companies' messages are not communicated effectively.

As a techie for a communication skills consulting firm, I've learned how important it is for technically oriented people to avoid the pitfall of communicating details instead of ideas. Often, poor decision-making by management is more a result of poor communications from research and development than it is a result of management's lack of technical expertise.

When technical people communicate with business managers and executives, they have to keep in mind how their work relates to the company's overall goals — not just the day-to-day problems they are trying to solve. And that's the bottom line.

Michael Stillwagon
McAlinden Associates, Inc.
New York

'Bug' born in '39

Apropos of the full-page advertiser tribute to Grace Murray Hopper [CW, Jan. 13], maybe it's time to finally put to rest the myth that the term "bug" was invented by people working on the Mark I.

While the story about the moth in the relay is likely true, the Mark I staff's use of the term "bug" was more of a pun than an invention. For example, in the Spencer Tracy movie *Edison, The Man,* there is a scene in which an Edison generator starts to shake itself apart. Edison shuts it down and then says to one of the onlooking investors, "Well, we still have a few bugs to work out," indicating that the term was already in common use, if not in Edison's day, then certainly at the time the movie was made.

The movie was made in 1939 and released in 1940. The Mark I project wasn't even begun until 1939 and was not delivered to Harvard until 1944. The moth was discovered in 1945.

Lee Gruenfeld
Marina del Ray, Calif.

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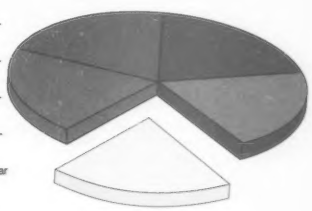

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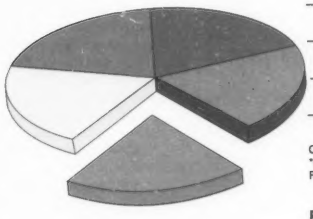

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Don't forget Dr. Frankenstein

LEE SPROULL and SARA KIESLER

When Mickey Mouse orders the broom to do his bidding in Walt Disney's *Fantasia*, every adult knows what's going to happen. Only children are amazed. In the real world, however, it's the adults who are surprised by the unexpected consequences of technology.

When Alexander Graham Bell invented the telephone, no one anticipated 800 numbers, telemarketing or teenage telephone addicts. When Henry Ford organized the first automobile assembly line, no one anticipated drive-in movies, suburbs or Los Angeles freeways. In each case, a technology introduced to improve efficiency led to a stream of social transformations.

It could happen to you

Computer vendors and information systems managers are today's equivalent of Mickey Mouse, Bell and Ford. The systems you develop and install to improve existing operations can have profound second-order consequences that may eventually be more important than what you set out to accomplish.

Many of you may think that second-order consequences are not your business. After all, it's hard enough to design and install systems to do the things they're supposed to do without also having to think about unanticipated second-order effects. But ignoring these effects won't make them go away.

Our research has already identified some second-order effects in networked organizations. Many of these outcomes are positive. Some are not. In either case, they are very much your business. You should be ready to capitalize on new opportunities from transformation and to mitigate its unanticipated negative consequences.

James Torok

Networked systems, particularly those that support person-to-person communication, change the way people connect with each other. Group dynamics change when discussions are held electronically. More people can contribute than is possible in face-to-face meetings, and people are often more willing to say what they think. Expertise, which may have developed in isolated pockets within the organization, can be shared.

Organizational structures are also affected. People can belong to many groups. Messages can bypass bureaucratic channels. Customers and suppliers can become much more tightly linked.

Not all rosy

But second-order consequences are not all positive. Electronic arguments can escalate to name calling and rude remarks that would never occur in face-to-face meetings. "Junk mail" can proliferate. Snooping and unauthorized surveillance of people's mail files can occur.

Networks can also alter the conventional boundary between work and leisure in ways that are problematic. Network activities can expand to include social discourse and entertainment that is hard for employers to justify.

In some instances, network communications are also creating a fertile ground of controversy over fundamental notions of free speech, liability and proprietary rights to intellectual discourse. If vendors and managers are not on top of these changes, lawmakers will tie their hands before they can react.

In many instances, changes that are primarily good can have negative aspects for some individuals. For example, because networks can provide low-cost, 24-hour access to almost any price and product information, they can eliminate the need for intermediaries who provide the link between buyers and sellers.

Although no one can specify the second-order consequences of any technology in advance, it is crucial, if you are designing or implementing systems, to include transformation in your vocabulary, because your real leverage could come from creating new methods of organization and new ways of working.

Sproull is professor of management at Boston University. Kiesler is professor of social and decision sciences at Carnegie Mellon University. Their book, *Connections: New Ways of Working in the Networked Organization*, was recently published by The MIT Press.

What IBM calls a cure looks more like self-destruction

HAROLD LORIN

Just before Thanksgiving, IBM announced yet another "restructure." The announcement contained the now-traditional staff reduction goals. But this time, we were also offered a view of what might be the beginning of the end for the abstraction we have known as IBM.

The announcement, which seemed primarily intended for mutual fund managers, implied a new insight into how IBM should be organized and how it should do business.

However, no fresh approaches were apparent. The announcement reflected the same product-by-product profit style that has driven IBM for nearly two decades. It confirmed organizational concepts that have prevented IBM from maintaining or reclaiming leadership in a market that is focusing on problems of systems integration and infrastructure.

The announcement assumed that what is essentially the current IBM product organization can be fragmented into product entities capable of vigorous competition. It also assumed that a whole must be less than its parts, ignoring the unique opportunity that an appropriately reorganized IBM could have to anticipate (reacting is not enough) the market dynamics of the 1990s.

Uncomfortable niches

For the currently defined "entities," the downside risk is that their designated niches will turn out to be either unsustainable or already occupied by competitors that invented or defined the technology. From a technology and product view, no IBM spin-off will lead in its niche. Only by synergy with other IBM products do IBM products become attractive.

A useful "restructure" of IBM would have to involve a technically visionary redistribution of product responsibilities that accurately reflects the changing boundaries of Unix and non-Unix cultures, the instability of the traditional roles of different machine classes and the need for new levels of system customization.

Deeper reforms needed

Surely "debureaucratization" is key now that there are keen sharks in momentarily shallow industry waters. But there are more than issues of "too many water coolers" here. IBM has long behaved as a capital assets management culture that empowers bureaucrats and bean counters. The inherent command and control culture discourages effective internal participation in setting direction for the company's future. Appropriate technology risk is not possible in this culture; neither is the creation of the kind of leadership appropriate for crisis.

In addition, the market-driven quality effort has encouraged undertakings that would make Franz Kafka proud. If reducing administrative burden were really a goal, it would make sense to eliminate the post of IBM director of telephone process — which sets standards for employee recorded telephone message excellence — before abandoning the search for a coherent product posture.

Ironically, the functions being blamed for IBM's problems are the corporate staffs, who resisted the culture of narrow interest and minimum increment. They struggled to achieve SAA and dragged IBM into the Unix world. The company's problems are actually due to unwillingness to reward these efforts.

Dedication needed

Institutions, as we learned from the former Soviet Union, dissolve when they have no reason to exist. IBM can avoid becoming the "former IBM," but it will require dedication to the technical vision and a different strategy for change . . . one that does not involve fragmenting along lines that have impeded its progress and caused its crisis.

There is talent at IBM that has for years tried to inform management that a strategic vision is necessary and available.

Attention to these voices could prevent a calamity that would strike deeply at America's industrial future.

Lorin is principal consultant at the Manticore Consultancy. He was formerly institute consultant at the IBM Systems Research Institute and the Data Systems Division.

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HARDWARE SHORTS

Option for DEC VAXs

Third-party maintenance firm Novadyne Computer Systems, Inc. recently started providing service for **Digital Equipment Corp.** VAX 4000 and VAX 6000 systems. The firm services all DEC systems through the VAX 8000 line, officials said. Novadyne offers DEC users guaranteed response, on-site hardware service and installation, VMS support and remote diagnostics.

Sybase, Inc. and **Sequent Computer Systems, Inc.** announced that they achieved mainframe-level performance with Sybase SQL Server Release 4.8 running on Sequent's Symmetry 2000 Model 700. **Oracle Corp.** and **Informix Corp.** audited TPC Benchmark A tests on the same Sequent platform. Sybase reportedly achieved 168.9 trans/sec. Oracle 6.0 reached at 164.14 trans/sec.; Informix Online 4.0, 129.19 trans/sec.

Users stress multivendor access

BY JOHANNA AMBROSIO
CW STAFF

A group of users, keenly aware of the complexity of accessing data in multivendor enterprise environments, recently made some strong suggestions about how to make the task easier.

At the top of the list is this: Vendors should adopt the Open Software Foundation's Distributed Computing Environment (DCE) as a way to at least connect multivendor systems and access remote data. The one caveat, users said, was that transaction processing extensions are needed to help DCE run in an on-line environment.

These and other suggestions came to the fore at a series of roundtables hosted by X/Open Consortium Ltd. in September and October, the results of which have recently been made public by X/Open. Some 16 users and a dozen or so vendors participated in the roundtables, but only the users had voting rights.

X/Open will give the ideas to several working groups of vendors to help guide their development processes, but it may take a while for the users' wish list to make its way into actual products. "The working plans for 1992 are pretty much set," said Terry Barrett, director of the Unix computing environment at Bellcore and the user "champion" for the workshops. "I don't think anything will begin to happen until next year."

The theme of the workshops was accessing mainframe data in a mixed environment of proprietary and open systems. "Proprietary mainframes are not going away anytime soon," Barrett said. "So it's important that there be interoperability and coexistence between them."

Still, even though DCE was at the top of the list, it was a controversial item. Charles Stainer, a

Continued on page 31

Wants or needs

Users are looking to vendors to fulfill their data access needs

Cross platform data access: What users want . . .

(In order of importance)

- Adoption of the OSF's DCE.
- Global data dictionaries.
- Global data integrity.
- Remote database access.
- One standard access language for all types of data and data models.

Source: X/Open Consortium Ltd.

Unix more show than action at Uniforum

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — Information systems managers were able to see vendors' visions of ruggedized Unix systems at the Uniforum show here late last month.

Vendors assured attendees that a combination of Unix operating systems, relational databases, redundant arrays of inexpensive disk (RAID) storage systems and tape backup devices shown would provide just as much reliability as IBM's proprietary mainframe systems. But much work remains to be done before Unix can be considered equivalent in system safety and reliability to many proprietary computer systems, users said.

"Fully recoverable file systems are sorely lacking in most Unix products," said Mike Lanier, vice president of information services at DHL Corp. in Redwood City, Calif. "We would like to see vendors address that issue as well as security for open systems."

"The questions about the reliability of Unix have not yet given way," said David McGoveran, president of Alternative Technologies in Boulder Creek, Calif.

No worry

Other vendors brushed away concerns by showing off powerful multiprocessing computers that ran relational database management systems at high speed. Pyramid Technology Corp. in Mountain View, Calif., announced an Availability Assurance program for its Miserver S series of computers. A new Fasttrac tape backup system was designed to copy databases onto multiple tape cartridges at high speed. The $10,000 Fasttrac product works with databases from Oracle Corp., Informix Software, Inc., Ask Computer Systems, Inc.'s Ingres Products Division, Sybase, Inc. and Unify Corp.

AT&T's NCR Corp. subsidiary showed working models of its forthcoming NCR 3600 parallel processor, which is now due

Continued on page 34

Prime/HP reseller pact too late for some users

BY KIM S. NASH
CW STAFF

Prime Computer, Inc.'s recent reseller agreement with Hewlett-Packard Co. bolstered faith in Prime's financial situation and cleared a neat path for proprietary 50 series shops to ride into the Unix world, according to users and analysts.

"Prime will be better off as a distributor from a financial standpoint," said Larry Pratt, former president of the Mid-America Prime Users Group.

However, most agreed that the road to open systems will not be smooth for Prime users or the financially precarious company itself. For some, the agreement came too late.

With seven 50 series boxes running a full range of business applications, Alumax, Inc. in Norcross, Ga., has been a loyal Prime client for about seven years. However, the aluminum processing company decided five months ago to leave the proprietary hardware for an as-yet-undetermined Unix platform.

"Had we seen this from Prime six months ago, we never would have looked at other vendors," said Bruce Kerns, director of MIS. As it stands, Alumax has talked Unix with Digital Equipment Corp., Data General Corp., IBM and HP, among others. A decision should come this month, he said.

Under the pact announced two weeks ago, Prime plans to resell $400 million worth of HP 9000 Series 800 and HP Apollo Series 700 computers during the next 3½ years. Prime Service will provide peripherals, software and support for HP products sold by Prime.

Also, Prime will port its Prime Information application development environment to Series 800 boxes by the end of March. Computervision Corp., Prime's computer-aided design and manufacturing unit, agreed to move its popular CADDS-5 and Calma packages to the Series 700 Precision Architecture reduced instruction set computing (PA-RISC) line in the same time frame [CW, Jan. 20].

Bumpy future

The plan sounds good, but Prime could hit bumps that disrupt its future financial stability if a good chunk of its 50 series customers opts to junk existing applications and start over with new software, observers noted.

Prime is trying to persuade its 50 series installed base — 9,700 systems, according to Computer Intelligence/Infocorp's latest tally — to hang on to existing PrimeOS-based applications and convert them to HP's PA-RISC. Prime hopes to earn its profits by supporting the new HP hardware/Prime software setups.

Like other proprietary minicomputer vendors — notably Wang Laboratories, Inc. — Prime's stay-alive strategy is software and service.

This deal marks the end of Prime's days as a hardware maker, according to Bill Sines, director of midrange strategies at Technology Investment Strategies Corp. in Framingham, Mass.

"They won't leave existing customers swinging in the wind, but they're focusing on software only now," he said.

Neil McMullen, president of Prime's Computer Systems Business Unit, would not say whether HP bought or might buy an equity stake or inject a lump sum of cash into Prime. However, some people compared the agreement to the one between IBM and Wang.

In June, IBM handed over $25 million in exchange for Wang's pledge to wean its installed base of proprietary virtual storage machines to Application System/400 midrange and Unix-based RISC System/6000 systems. Both minicomputer vendors have constructed survival strategies based on providing software and service to other companies' hardware.

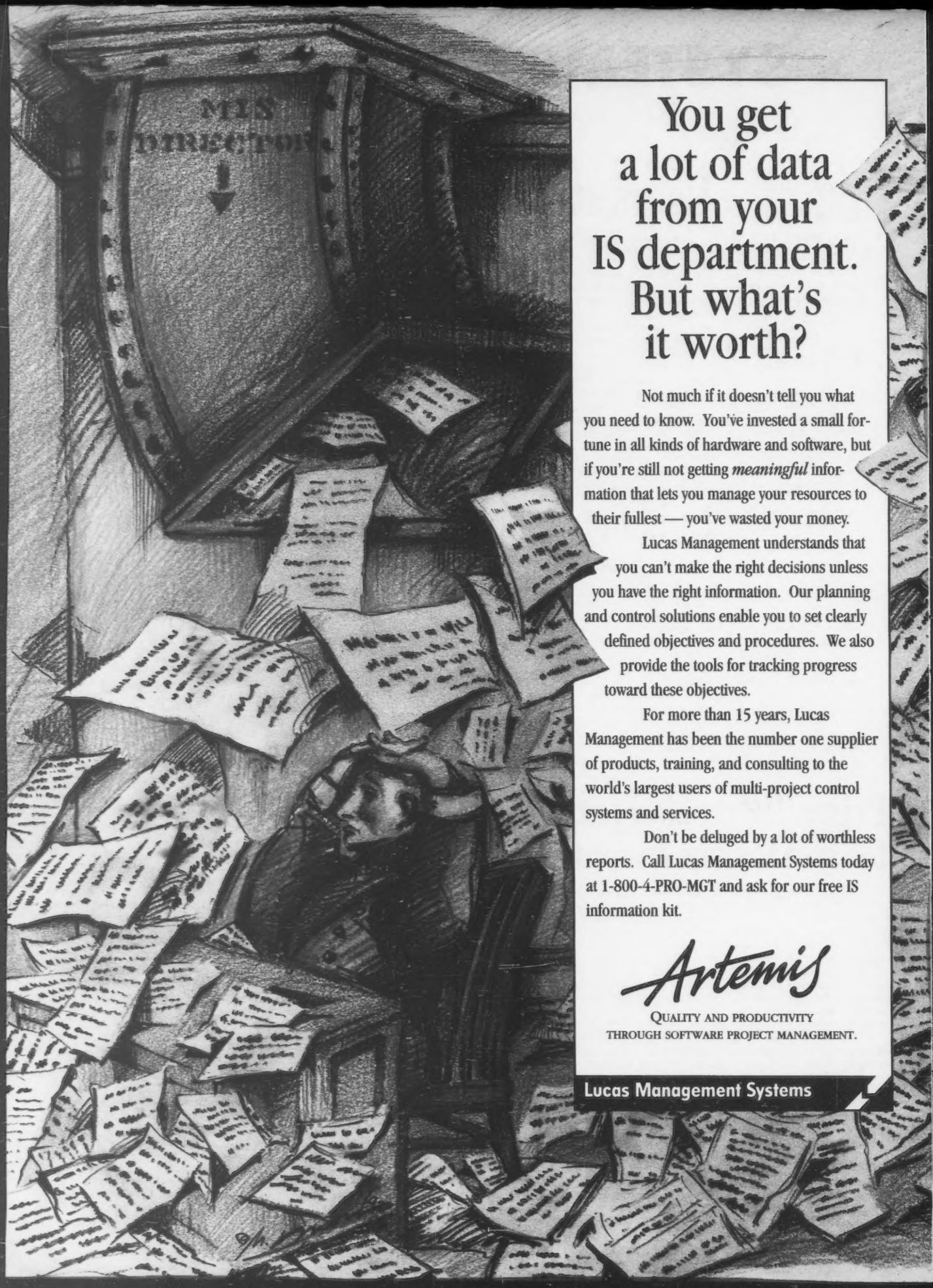
The new deal might step on toes belonging to Sun Microsystems, Inc. and Mips Computer Systems, Inc., according to Pratt.

Sun and Mips both have separate reseller deals with Prime, but those are not valued as highly as the HP contract.

Under Prime's existing contract with Sun — renewed for five years in October — Computervision will resell $200 million worth of Sun workstations and servers bundled with CADDS-5. Meanwhile, Prime has a 1½-year-old technology contract with Mips to market a RISC-based line called EXL, based on processors from Mips.

While Pratt said the HP agreement gives him more confidence in Prime as a business, he questioned the vendor's commitment to Mips and Sun. "If Prime bought that much HP, they're going to have to push hard in that direction," he said.

Not so, McMullen countered. "We'll let the users decide for themselves," he said.



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Cutting-edge software the key to food distributor's savings

BY GARY H. ANTHES
CW STAFF

HICKORY, N.C. — Merchants Distributors, Inc. (MDI), a billion-dollar-a-year wholesale food distributor and retailer, operates in an industry with paper-thin profit margins, and its penny-pinching information systems strategy combines low-cost hardware with state-of-the-art software.

When MDI's VM/VSE-based IBM 4381 began to run out of steam several years ago, the company considered upgrading to a new machine running MVS, a step that would have required about $2 million for hardware, software and software conversion. MDI decided instead to just buy more iron — a used IBM 3081 running the same VM/VSE. That cost MDI $120,000 and bought the company another three years of processing.

"We tend not to be on the current generation of hardware. We wait for prices to go down," said Calvin S. Sihilling, vice president of IS. "We decided the benefits [of MVS] did not justify the cost."

Equally important, staying with the same environment let MDI's development staff sidestep a one-year conversion effort, allowing it to get on with developing critical applications.

Into the 4GL world

Sihilling took a different tack on the software front, deciding to move out of the Cobol-CICS-VSAM era and into the world of fourth-generation languages (4GL), application generators and relational databases. "The key objective was to decrease the time from business need to solution, to react more quickly," Sihilling said.

MDI is the parent organization for three companies — MDI Wholesale, a food distributor to grocery stores; Institution Food House, Inc., a supplier to restaurants, hospitals and other institutions; and Lowe's Food Stores, a 52-store retail chain in North Carolina and Virginia. The three companies handle 30,000 items and make 1,400 truckload deliveries a week in 10 Southern states, Sihilling said.

The companies share some financial and administrative systems but have separate systems for mission-critical applications such as purchasing, order processing and billing. As a result of their widely varying requirements, Sihilling has a development group for each company and one for corporate systems.

When MDI turned to software, it considered products from IBM, Cincom Systems, Inc., Computer Associates International, Inc. and Software AG of North America, Inc. MDI chose Software AG to supply the Adabas database management system, Natural 4GL, the Natural Construct application generator and the Adabas/VSAM Bridge.

"They won hands down," Sihilling said. Reason: Software AG was the only company that offered both an application generation tool and an automated bridge from the relational database to VSAM file calls in existing Cobol programs.

MDI's customer file is accessed by 454 different programs, and the VSAM bridge will allow the file to be loaded into Adabas in order to write a new order entry and billing system without having to touch the old Cobol programs that access the customer database from other applications.

"The bridge is a life-support system; it eliminates the need for the big-bang approach," Sihilling said. "We can say, 'What should the data look like in the future?' then bridge into that for new software while the old software remains."

Once data gets into Adabas, MDI goes at it with Natural Construct, which generates large chunks of Natural code from a few keystrokes. At a terminal, one of Sihilling's programmer/analysts generated a complete, albeit simple, file-maintenance program in about five minutes.

Specialized functions that cannot be generated by Natural Construct are custom-coded in the Natural 4GL and attached to Natural Construct user exits. Sihilling said about half the source code developed by MDI so far has been generated by Natural Construct while half has been coded directly in Natural.

Sihilling said the cost of the Software AG products, including 12 to 14 weeks of on-site support from the vendor, was between $250,000 and $300,000.

Sihilling said the move away from the old development environment will be gradual but inexorable, with no new applications coming up in Cobol. "I'll be disappointed if we don't double our [application developers'] productivity, at least, once we get completely up to speed."

ON SITE

Merchants Distributors, Inc.
Hickory, N.C.

- **Challenge:** Prove effective information systems while keeping down costs in a food distribution and retail sector that traditionally survives on thin profit margins.
- **Strategy:** Save money by acquiring used hardware and rely on 4GLs, application generators and relational databases to improve productivity.
- **Goals:** Save more than $1.7 million in hardware costs and to at least double productivity.

Room for proprietary systems in Unix world

BY SALLY CUSACK
CW STAFF

While the push for open systems is definitely on, Unix-based and proprietary midrange systems will apparently coexist peacefully well beyond the year 2000.

Michael J. O'Hara, director of information systems for the county of Rockingham in Harrisonburg, Va., may be a typical midrange systems user. He is evaluating Unix systems as a possible front end for the county's IBM Application System/400 B45. The B45 is running integrated financials, real estate and court-related information for the county, but various vendors' platforms operate in other departments.

"The Unix processor would allow us to pull data from any other platform in the county," O'Hara said, adding that the AS/400 has worked well and that the county will continue to rely on the B45 for the financial applications.

"This market is in various stages of maturity. There is a big market out there for using Unix boxes while maintaining older systems," said Darcy Fowkes, research manager at International Technology Group in Los Altos, Calif.

Fowkes said the market is dividing as users demand more openness and flexibility.

Major vendors such as IBM and Digital Equipment Corp. are incorporating Unix as a step toward open systems to meet user demands, Fowkes said, but she predicted that the world will still have dual-system IS shops for the next 20 years.

At present, users mixing the two Unix and proprietary architectures are meeting with success. Some have found that incorporating both environments to form a whole within IS has its benefits.

Royal Caribbean Cruise Lines in Miami is an example of this. The luxury cruise line relies on four AS/400s connected to various Unix environments and other networks to handle its business. The AS/400s handle all passenger-related accounting and business systems, and the company uses Transmission Control Protocol/Internet Protocol support for communicating with Unix-based Sun Microsystems, Inc. workstations, both shipboard and shoreside, for a yield management application.

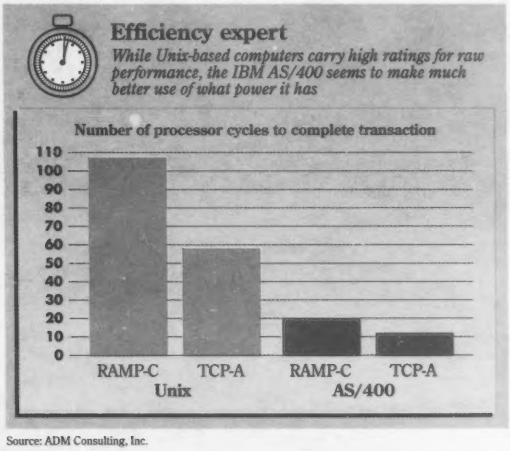
Another state agency in New York uses AS/400 technology extensively for heavy-duty database-type applications while maintaining NCR Corp. Unix-based Tower computers for a specialized, in-house application. The agency is very pleased with both technologies.

Better value

ADM Consulting, Inc., a consulting and research firm for the midrange market, claims that when all relevant factors are considered, IBM AS/400 systems tend to represent a much better value in the commercial marketplace than current Unix alternatives. Since commercial work is highly I/O-intensive, the AS/400 often performs better than Unix computers in the commercial area, according to the report.

According to Computer Intelligence, the use of Unix in the commercial environment is on the upswing. CI reported that 17% of new applications planned for Unix boxes are of commercial origin.

While Unix vendors are catching up to the sophistication of the matured midrange machines, vendors such as IBM have promised support for all the open standards as they emerge — including Open Systems Interconnect, the Open Software Foundation's Distributed Computing Environment and Posix.



Source: ADM Consulting, Inc.

NEW DEALS

City courts Cincom

The San Francisco Municipal Court system has signed up for Cincom Systems, Inc.'s AD/Advantage application development system as its backbone computer-aided software engineering environment to write software for the IBM mainframe as well as Digital Equipment Corp. and personal computer environments. The courts will also use AD/Advantage to integrate other development tools in the future.

The State Savings Bank in Warsaw has purchased a Sequoia Systems, Inc. Series 400 computer in a contract that is valued at $1.5 million. The Series 400, including an Oracle Corp. database management system, is the largest of three Sequoia systems recently shipped to Poland. The bank plans to use the machine to improve on-line transactions and streamline the existing method for accounting.

Posix shell brings Unix to HP 3000

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — Hewlett-Packard Co. is giving users of its proprietary HP 3000 systems a way to write Unix-compatible applications without migrating away from their hardware.

By year's end, Cupertino, Calif.-based HP will ship a Posix software shell that will run on top of the MPE/IX operating system. The new Posix software — a package compliant with the ANSI Posix.2 standard — will allow users to develop Unix-compatible applications on HP's large installed base of HP 3000s.

HP said this month that it obtained the Posix.2 software from a third-party Canadian supplier, Mortice Kern Systems, Inc. in Waterloo, Ontario. The same Posix.2 software has been adapted for Digital Equipment Corp. VAX machines running VMS and for Unisys Corp. machines running CTOS, spokesmen for Mortice Kern said.

At the recent Uniforum show here, representatives of DEC, HP and Unisys jointly stated their common use of the Posix software.

The display of vendor cooperation did not surprise some industry analysts.

"The fact that they're Posix-conformant and passed the validation [test] suites should be enough," said Michael Goulde, editor of the Boston-based "Unix in the Office" newsletter. "But perhaps they believe that using the same code base will make users into true believers."

The Posix.2 standard was developed by the ANSI committee as a way to develop portable Unix applications on various hardware platforms. "An application written for Unix is not guaranteed to run on a Posix system," explained Randall Howard, president of Mortice Kern. "But if you write a Posix application, it will run on systems that have a Posix interface — and it will also run on top of Unix."

Although HP acquired a license for the Posix package in 1991, it has been working to comply with ANSI Posix standards for four years, said Sridhar Ramanathan, open systems product manager for HP's Commercial Systems Division. In December, HP shipped a home-grown package compliant with the free Posix.1 standard for the HP 3000.

The Posix.1 tool kit includes a set of MPE/IX system calls as well as a Unix-compatible directory structure, marrying the MPE/IX architecture to the Unix-compatible Posix software.

Prices have not been announced for the Posix.2 shell. The developer kit is priced from $10,000 to $50,000, HP said.

SOFTWARE SHORT

Integris buys Unikix

Integris, the systems integration unit of Bull HN Information Systems, Inc., recently bought Unikix, a program from a small Glendale, Calif.-based company. The product gives Integris another entree into the IBM CICS-to-Unix conversion market. Unikix, from Unicorn Systems Co., lets users run existing CICS, Cobol and VSAM applications on Unix platforms, including IBM, Mips Computer Systems, Inc., Sun Microsystems, Inc. and Bull. Integris will service Unicorn's 25 Unikix users. Unicorn also sold its VM CICS product to Integris, which demonstrated the systems at Uniforum in San Francisco last week.

DG addresses needs of small RAID users

BY KIM S. NASH
CW STAFF

WESTBORO, Mass. — Data General Corp. recently plugged a hole in its line of high availability disk arrays (HADA) for Aviion workstation and server machines.

The new product, Model 7904 HADA 2.5G-byte Disk Array, is targeted at Aviion users with smaller storage capacity requirements who want redundant arrays of inexpensive disks (RAID) technology. DG already had a 5G-byte model for Aviion users, the Model 7902 HADA, but lacked a device for companies that did not need that much storage space.

Like the 7902, Model 7904 uses RAID technology. RAID storage devices let users remove and replace faulty drives without interrupting running applications or losing data.

After a new drive is installed, the RAID capability automatically reconstructs the new drive for the system.

The Model 7904 will be bundled with Aviion 6000 and 8000 series machines packaged with DG/UX, the company's brand of Unix based on AT&T System V. Subsystem Model 7904 is priced at $42,000.

An add-in group of five 500M-byte disk drives for existing HADA cabinets is available for $23,000. A single 500M-byte hot-repair disk drive add-in to an existing HADA lists for $5,000.

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Users stress multivendor

CONTINUED FROM PAGE 27

data architect for the U.S. Air Force in Washington and a participant in the roundtables, said, "There was a strong feeling that we as a group should not recommend a specific product as a standard. But there is a DCE specification and methodology, and that's what we're recommending — not one vendor's implementation of DCE."

It takes all kinds

Another fundamental requirement was that vendors consider all kinds of information, including text, numeric, graphic, image and audio. Also, different kinds of information models need to be incorporated into the enterprise scheme.

Other items on the user list included the following:

- Global data dictionaries that contain lists of all enterprise data, regardless of type, where it is stored or the computer it is stored on. These data dictionaries need not be held in one place and can be distributed among different systems.
- Global data integrity that maintains the quality of the data in the event of a crash This would provide for re-establishing links between two sites if something were to go wrong.
- Remote data access, which essentially means support for getting SQL information out of proprietary databases.
- One standard access language for all types of information and information models. Suggestions included an extension to SQL.

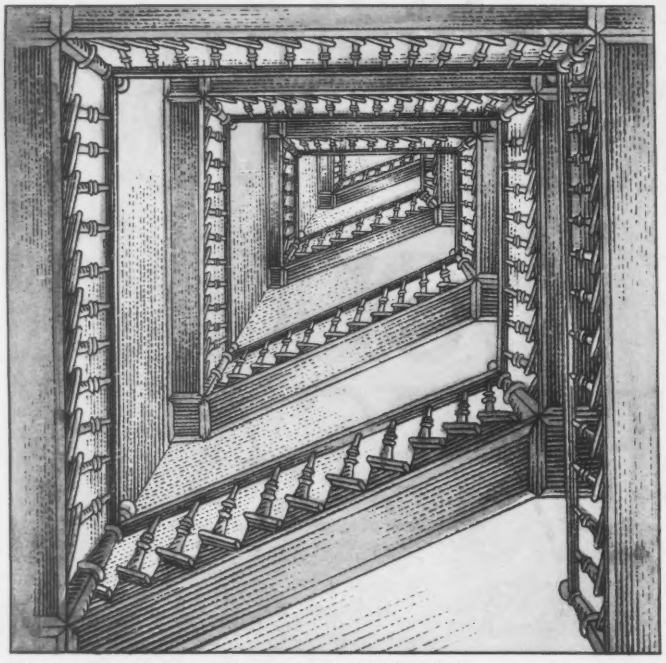
That last point, the users involved acknowledged, is a blue-sky item that they do not expect to be implemented anytime soon. "We're just trying to spur the industry on to develop something like that," Stainer said.

Barrett added that the workshop participants were trying to prevent interoperability problems among some of the newer technologies.

"There is no dominant query method for object-oriented databases," he said. "There are about eight products on the market, all different. We wanted to make a statement that something needs to be done about that."

When it comes to enterprisewide connectivity, not all e-mail systems work quite the same way.

While a lot of LAN-based electronic messaging systems provide connectivity across a variety of computing platforms, many don't do a very good job of it. The fact is that connectivity with poor performance is like not having any connectivity at all.



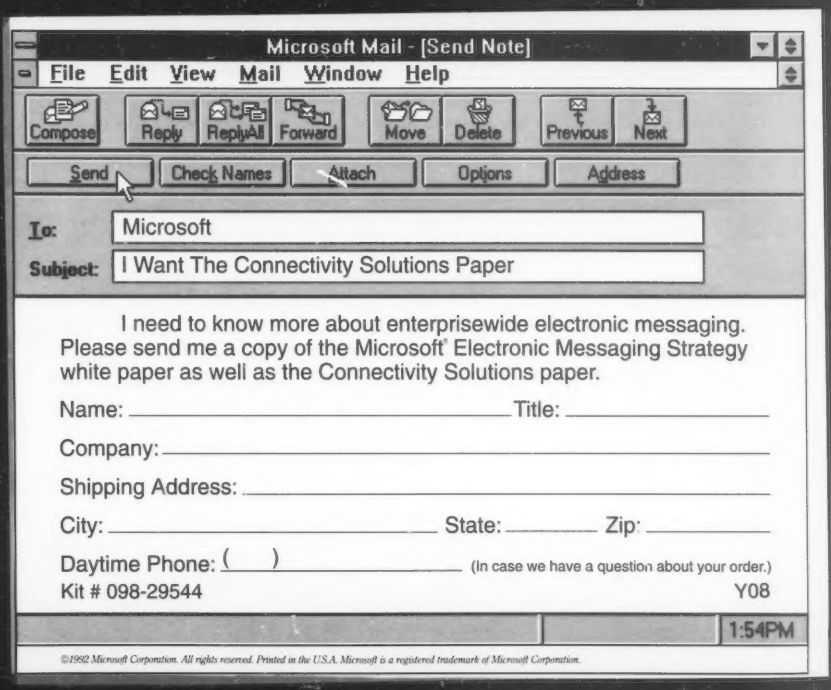
Electronic mail is quickly becoming a mission-critical component of day-to-day operations for many businesses. Despite this, research indicates that about 90% of all Fortune 1000 corporations can't communicate across their disconnected e-mail systems†.

This underscores how difficult it is to achieve quality connectivity in today's corporate environment. The reality is that LAN-based e-mail systems must be able to work in a robust fashion with an organization's existing LAN, minicomputer and mainframe systems.

What makes things even more complex is that technology is still in transition, so any connectivity decision you make today must also include an assessment of the future and how you plan to get your company there. Which means the pressure to architect an optimal long-term solution is extremely high.

If you're responsible for implementing and managing LAN-based systems, you should look beyond simple "checklist" connectivity and ask some very difficult questions. Questions like will the gateway enable you to leverage a messaging backbone to connect all of your dispersed LANs? Will the gateway support encapsulation to preserve rich data integrity? How tightly will the gateway be integrated with the e-mail system for directory synchronization and adminis-

† Forrester Research 1991. © 1992 Microsoft Corporation. All rights reserved. Printed in the U.S.A. In the 50 United States, call (800) 227-4679, Dept. X95. In Canada, call (800) 563-9048; outside the United States and Canada, call (206) 936-8661.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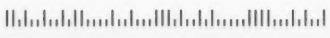

tration? How easily can users address messages to recipients on foreign e-mail systems?

Quality of connectivity is the critical factor. Simply sending interpersonal messages through a maze of gateways is only a minimum requirement. Too often, gateways can limit the overall functionality of the e-mail system, when in practice they should be expanding it. E-mail has evolved into a complex system of post offices, MTAs and gateways that must all cooperate as one entity. And relying on multiple electronic mail vendors just adds to the complexity. Which is why the selection of a vendor supplying connectivity technology is as important as the technology itself.

A single-source vendor can provide technical support and accountability for your entire LAN-based e-mail system. And products which are designed and developed together will deliver higher quality connectivity.

Another point to keep in mind is that a single-source vendor is much more likely to make timely technological enhancements to gateways that parallel improvements made in their e-mail system. For example, if your e-mail system evolves to allow users to embed charts in their messages, your gateways should evolve so that messages can be sent without losing formatting or data.

We have spent a lot of time studying and researching connectivity. And as a result, we feel we have a unique understanding of the complex issues you face when implementing a complete electronic messaging system. At Microsoft we have the technology and resources to provide the highest quality solutions now and in the future.

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Unix more show than action at Uniforum

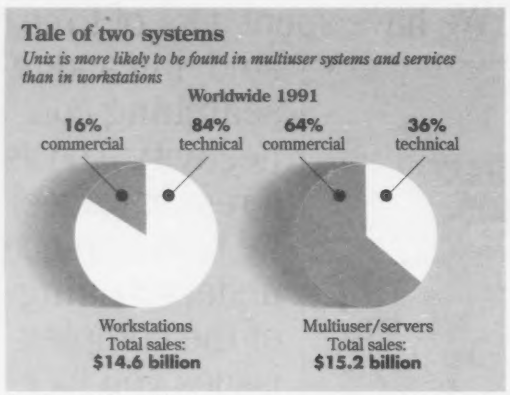
CONTINUED FROM PAGE 27

to go into beta-test sites in March. As shown, the NCR 3600 ran Oracle's 6.2 parallel RDBMS server, which has been optimized for the NCR 3600. The NCR 3600 machine can be outfitted with RAID arrays or with rows of standard disks to protect data in the event of system outages, NCR said.

At the same time, IBM disclosed that it is trying to improve the Unix knowledge of its field service engineers, many of whom came to the Uniforum conference to learn Unix techniques alongside their IS customers. Starting from scratch three years ago, IBM said it had 950 AIX troubleshooters by the end of 1991. The company wants to add another 250 field service people to its branch offices by 1993, even though other IBM operations will be paring back this year.

Other Uniforum developments included the following:

- The Santa Cruz Operation (SCO), which has more than 80% of the market for Unix on Intel Corp.-based personal computers, announced a new version of its SCO operating system. SCO's new Version 4.0 is said to offer greater ease of use, greater system capacity and more network and device support. It will ship in 30 days, company officials said. SCO also announced an agreement with Unix System Laboratories, Inc. (USL) in Summit, N.J., to put USL's Tuxedo transaction processing system on SCO Open Desktop systems.
- USL announced the availability of an enhanced multiprocessor version of System V Release 4 for computers based on the Intel 80386 and Intel I486 microprocessors. Version 2.0 extends the number of individual CPUs supported and works with MS-DOS applications, USL said.
- Sun Microsystems, Inc. introduced the Solaris 2.0 Migration Kit, a free set of tools and documentation that will ship in volume in 60 days, to migrate user programs to the Solaris 2.0 operating system. Sun also said it had signed with Visystems, Inc. in Dallas, to port the VIS/TP Transaction Processing System product line known as "CICS on Unix" to Sun workstations and servers. The port will give Sun the chance to sell its high-end servers as IBM mainframe-compatible distributed systems, Sun said.
- Network Computer Devices, Inc., the industry leader in X terminal sales, introduced three new high-resolution reduced instruction set computing-based models, including the first X terminal to use the Mips Computer Systems, Inc. R3000 RISC microprocessor. Prices range from $2,895 to $5,395.



Source: Computer Intelligence/Infocorp.

Top airlines to set up global cargo system

BY LORI VALIGRA
IDG NEWS SERVICE

TOKYO — Eleven top international airlines recently reached a basic agreement to develop a cargo information system that will be put on a network they will share.

The aim of the network is to let cargo owners or their agents quickly access booking information for transportation and track individual cargo in transit, according to one industry watcher. He added that the system should improve customer service and help prevent parcel loss while streamlining cargo operations.

Airlines have been increasing their cargo businesses in recent years. Last August, Japan Air Lines Co., Lufthansa German Airlines, Air France and Cathay Pacific Airways Ltd. set up an IS joint venture company in Frankfurt. The four airlines are constructing a system that will improve booking and access to customs information. This time, British Airways, Singapore Airlines, KLM Royal Dutch Airlines, Air Canada, Aer Lingus and Swiss Air Transport Co. joined the project.

The 10 firms have set up a joint working group to link their cargo information systems to a host computer at the new company in Frankfurt to improve cargo transportation, according to an industry source. In addition, Korean Air Lines has basically agreed to join the 10 other companies and invest in the Frankfurt firm, the source said.

NEW PRODUCTS — SOFTWARE

Development tools

Parasoft Corp. has announced the availability of its Express parallel processing software development environment on the Alliant Computer Systems Corp. Campus/800 and FX/2800 supercomputers.

The Express environment includes an automatic parallel code conversion tool, a parallel debugger, an algorithmic visualizer, a data communications library and a set of applications performance tools.

Pricing starts at approximately $5,000.

Parasoft
Suite 205
2500 E. Foothill Road
Pasadena, Calif. 91107
(818) 792-9941

Liant Software Corp. has announced the availability of C-Scape 3.2C VMS, a programming tool for Digital Equipment Corp. VAX users.

C-Scape 3.2C VMS is an object-oriented interface management system, providing users with a library of C language routines for creating application interfaces. Both character-based and graphical user interfaces are supported. The product includes Liant's Look and Feel program for prototyping interfaces and automatically generating code.

Pricing is $1,874 per user until Feb. 14; after that, the cost is $2,499 per user.

Liant Software
959 Concord St.
Framingham, Mass. 01701
(508) 872-8700

Database management systems

Compuserve, Inc.'s Data Technologies Group has announced Version 9 of its relational database management system software for the Digital Equipment Corp. VAX.

System 1032 includes a fourth-generation language. A Collect Join function for manipulating massive databases and a new windowing user interface are also among the enhancements to Version 9.

The product is also more tightly integrated with the VMS operating system.

Pricing ranges from $6,000 to $240,000, based on central processor size.

Compuserve
Data Technologies Group
1000 Massachusetts Ave.
Cambridge, Mass. 02138
(617) 661-9440

Applied Digital Data Systems, Inc., a subsidiary of NCR Corp., has introduced its Unidata relational database management system for the NCR System 3000 computer family.

Unidata is a SQL-based data management system running under NCR Unix System V Release 4. It supports both Pick operating systems and Prime Computer, Inc. Information applications.

End-user pricing starts at $1,005, depending on hardware configuration, features and number of users.

Applied Digital Data Systems
Systems Division
100 Marcus Blvd.
Hauppauge, N.Y. 11788
(516) 231-5400

Utilities

Boole & Babbage, Inc. has upgraded its Mainview Solutions software for automating data center operations.

The product works with the company's Autooperator software to offer a set of ready-to-use automation applications for MVS shops with IBM CICS, IMS and DB2 subsystems. Automated procedures include system and subsystem recovery, on-line system start-up and shutdown, job monitoring and allocation of CICS files. Existing automated Netview functions can be incorporated.

Pricing starts at $2,000.

Boole & Babbage
510 Oakmead Pkwy.
Sunnyvale, Calif. 94086
(408) 735-9550

HARDWARE

Data storage

Magna Computer Corp. has created Voyager, an IBM Application System/400 backup controller. Multiple data recording modes, off-line tape copying, diagnostics features and an LCD console for configuration and operation are standard with the new product. It also offers multiple small computer systems interface ports.

Four-millimeter and 8mm subsystems with the controller are available; pricing ranges from $6,500 to $24,500.

Magna Computer
22 Keewaydin Drive
Salem, N.H. 03079
(603) 898-3555

Cambex Corp. has introduced the Certainty 6200-T storage subsystem for IBM RISC System/6000 users.

The customizable product allows users to configure multiple small computer systems interface devices in a single tower. Certainty 6200-T costs $3,650.

The company has also announced Certi-Stor, a software utility for disk mirroring in RS/6000 environments. A permanent license costs $2,500.

Cambex
360 Second Ave.
Waltham, Mass. 02154
(617) 890-6000

Processors

Harris Corp.'s Computer Systems Division has introduced a new system in its Night Hawk 4800 line of real-time Unix computers.

A 13-slot, rack-mountable chassis version of the Night Hawk 4800 is now offered for custom configurations. It houses up to six processors, 128M bytes of memory and 12 VME I/O cards.

Pricing starts at $74,500.

Harris Computer Systems
2101 W. Cypress Creek Road
Ft. Lauderdale, Fla. 33309
(305) 974-1700

I/O devices

Nemonix, Inc. has devised a board-level upgrade for Digital Equipment Corp.'s HSC50 disk drive controller.

Performance is enhanced by up to 40% by the Nemonix NXC5-XL, the firm said. The upgrade doubles control memory to 256K bytes, expands data memory to 512K bytes and program memory to 1M byte and increases the central processor instruction rates. The product costs $18,000 and includes a lifetime warranty.

Nemonix
25 South St.
Hopkinton, Mass. 01748
(508) 435-9087

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NEW DEALS

Apple gets D&B gear

Apple Computer, Inc. and **Dun & Bradstreet Software** recently signed a contract valued at $1.2 million. D&B Software will provide Apple with financial applications to run on a Digital Equipment Corp. VAX computer. D&B will provide professional services to assist Apple employees with training, implementation and system customization. Apple will use the software packages in its corporate, distribution and products divisions.

Canada's Bureau of Competition Policy is installing a nationwide, workstation-based system as part of a $3.4 million systems project awarded by Consumer and Corporate Affairs Canada to Ottawa-based SHL Systemhouse, Inc. The bureau, which enforces rules and policies that improve competitive trade in the Canadian marketplace, will use a network of 100 Apple Macintoshes and eight Sun Microsystems, Inc. servers in offices around the country. Systemhouse is designing and implementing the first stage of the client/server system known as Competition Policy Automated Support Systems, or Compass. The major hardware subcontractors are Systemhouse's Computerland Canada subsidiary and Sun Microsystems of Canada, Inc.

Mission-critical tools aim at desktops

BY ROSEMARY HAMILTON
CW STAFF

Users may not be ready to run their companies on their desktops, but some are increasingly relying on them for mission-critical applications.

"What we are working towards is a desktop environment that is close to — and we aren't there yet — the functionality of the mainframe environment," said John Roberts, vice president of corporate research and technology at Unum Life Insurance Co. in Portland, Maine.

Several users contacted recently are installing core business applications on desktop platforms with the goal of incorporating mainframe-class features, such as reliability, integrity and security, onto these platforms. These functions are necessary to successfully run mission-critical applications and, until recently, have been available only on high-end hardware.

At the same time, they said, these systems will not replace mainframes, which will manage and store data for the desktop applications.

Application advancement

Users said advancements in desktop operating systems as well as the availability of mission-critical development tools tailored for the desktop are making it possible to install mainframe-class systems on smaller platforms. Also critical is transferring mainframe work habits and procedures to the newer environment, users added.

For example, Harris Methodist Health Systems is implementing a claims processing system under IBM's OS/2. The system, which will interface with a mainframe-based database management system, will run on servers located in the information systems department.

"Our servers are handled like mainframes, with uninterruptible power supplies, backups, physical security," said Larry Blevins, senior vice president of IS. "So we married the two. We brought the mainframe disciplines to the workstation platforms and local-area networks."

Industry analysts said the deployment of core business applications on desktops is in the early stages because the necessary tools are not yet widely available.

"This area will get more sophisticated in time," said Ed Acly, an analyst at Technology Investment Strategies Corp. in Framingham, Mass. "This is really the first of a wave."

Some users are relying on internal development and claim

Continued on page 48

Users see slow market for multiprocessors

ANALYSIS

BY MICHAEL FITZGERALD
CW STAFF

The multiprocessing market is a wide-open horse race, with vendors promising to jockey heavily for position as they bolt out of the gates. The question, though, is the perennial one for a new sport: Will it draw a crowd?

Users generally seem unimpressed by the idea of multiprocessing, though some are willing to take a look.

"The two biggest challenges we have do not require that much in the way of faster, bigger server machines," said Michael Purcell, a staff software engineer at Baxter Healthcare Corp.

Purcell said Baxter, which is heavily invested in local-area networks, wants cheaper servers for some of its smaller LANs and also wants to see the OS/2 LAN Manager environment become more mature.

Users and analysts in general agreed it will be slow going for vendors this year in the multiprocessing market, both because it lacks basic operating and application software and because hardware vendors are still readying products.

Multiprocessors have tended to fall in the highly specialized superserver category, such as Parallan Computer, Inc.'s Server 290 series, Tricord Systems, Inc.'s Powerframe and Netframe, Inc.'s Netframe. Although Compaq Computer Corp.'s Systempro is capable of running two processors at once, users rarely employ a second processor.

In the meantime, other traditional personal computer companies are pushing into the multiprocessing market. For instance, Everex Systems, Inc. recently began shipping its Step MP EISA, which supports six Intel Corp. 33-MHz I486 chips.

Many vendors, such as NCR Corp. and AST Research, Inc., tout multiprocessing architectures as an effective way for users to gain minicomputer or low-level mainframe performance, without paying the high up-front and maintenance costs. Everex's Step MP, for instance, claims to run The Santa Cruz Operation's Unix in a 128-user configuration at a price of $45,000.

Analysts, though, downplay any vendor hype for a big year in multiprocessing.

"Those things are probably 1994 or 1995," said Frank Dzubeck, president of Communication Network Architects, Inc. in Washington, D.C. "We're talking about a group of vendors which classically were on the desktop, and now have a chance to compete against a new rung of guys."

Dzubeck said the opportunity to offer Unix-driven open systems that do for as little as $15,000 what cost $300,000 in a proprietary minicomputer environment has vendors "drooling because they see new markets."

The downside, according to

Continued on page 48

Issues in multiprocessing include the following:

- No CPU or operating system has emerged as a leader.
- No off-the-shelf applications are available.
- Users must rewrite applications from scratch to run on new systems and to take advantage of multiprocessing.

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GFA Basic right Windows tool for this job

Rookie Windows programmer uses Basic to develop file management system for Cleveland Clinic

BY CHRISTOPHER LINDQUIST
CW STAFF

When Microsoft Corp.'s Windows Version 1.0 came out, Jon Grierson took a look at it and put it in the closet. When Windows 2.0 arrived, he did the same thing, though this time with a small prayer that the graphical interface would not catch on because the environment looked like a bear to program for. Then came Windows 3.0.

Grierson, now a senior programmer at the Cleveland Clinic Cardiology Division in Cleveland, found himself in the position of having to write a major production application for Windows without any prior Windows programming experience. Doctors at the clinic did not want to hear that it takes many programmers six months to a year to learn enough about Windows to program for it effectively. "I was under the gun," Grierson said.

After a few false starts, he found the tool for the job, GFA Basic for Windows from GFA Software Technologies, Inc. in Salem, Mass. What resulted was 5,000 lines of code that made up an extensive file management system. Grierson completed the job in two months by himself.

The first project was to be a file management system that would allow some 80 secretarial workers to generate and access patient documents over a Novell, Inc. network. In addition, the program needed to have integrated productivity tracking of such things as word count and line count for each secretary.

On top of that, the clinic needed a retrieval system that could search a wide variety of data for text, such as clinical numbers, to locate any misplaced files. Needless to say, it was a far cry from the traditional "Hello, world" program most people begin with.

Grierson, whose background was in engineering software, first looked to C as his development language of choice. However, it soon became obvious that the process was going to take too long if he had to learn how to work with the hundreds of Windows function calls directly in C. He needed something that would do a lot of the work for him yet still be powerful and fast enough to get the job done.

Grierson then looked to Microsoft's Visual Basic but soon lost interest. "I was excited about Visual Basic for about a week," he said. "Then I realized that I never get to see all the code. It was kind of boxing some of the stuff from me." He determined that the situation "wouldn't give me all the power I'd need down the road."

Next came Within Technology, Inc.'s Realizer — another Basic-based Windows development tool. "Realizer gave me more power," he said, "but it moves like a turtle." He said the language would be suitable for smaller projects that were not as speed-dependent as applications.

What he needed was something with the speed of C and the ease of use of Basic. Then he saw an advertisement for GFA Basic for Windows that seemed to promise what he wanted. "I ordered it. I started working with it. I fell in love with it."

He described GFA Basic as a "cross-bred" language combining the syntax of Basic with the powerful features of C, such as pointers. In addition, he said, the compiled code is extremely fast. Armed with his new tool, Grierson went to work.

In the process of completing the project, he found he was also gaining a deep understanding of the Windows application programming interface without all the hazards and traps of learning it in C. "You learn a really deep understanding of how the [Software Developers Kit] works in a fairly protected environment," he said. That knowledge will help on his next project, a tracking system for cardiology films.

Grierson said that while programmers are often impressed with the short time it took for his last project, the doctors at the clinic are not so awed: "Around here, everything needs to be done yesterday."

PPS revamped for spring 3.1 release

BY JAMES DALY
CW STAFF

REDMOND, Wash. — The expected arrival of Windows 3.1 in early spring will give users their first crack at Microsoft Corp.'s revamped Product Support Services (PSS) organization, where a six-month renovation has eradicated memories of waiting 10 minutes or more to speak with a technician.

Senior Vice President Scott Oki claimed that through technical updates and the hiring of more than 400 staff members, Microsoft has made good on last year's promise to bolster its support services. Oki said PSS can now handle 13,000 calls daily and can offer a typical response time of less than a minute. That average was more than four minutes a year ago, he said.

In an industry filled with products that are sometimes remarkably similar, Microsoft has looked to customer support as a way to stay ahead of the competition. Overloaded technical support lines have become a sore point in an industry that once banked on the image that high tech was simple and foolproof.

"It is really embarrassing that people have to wait so long on the phone to talk with us about problems in our products," Microsoft Chairman William Gates proclaimed in an internal memo early last year.

In many ways, Microsoft's support services were the victim of the firm's success. In the wake of the tremendous sales of Windows 3.0, PSS was averaging 9,400 calls a day by January 1991. The service could handle only 7,400.

The latest portion of the rejuvenation plan was completed in October, when the company's third support center opened in Dallas — joining two others already in place in Bellevue, Wash., and Charlotte, N.C. Together, the centers employ 1,350 technicians who can handle questions on any of more than 100 Microsoft products.

Updating PSS began more than two years ago, when the group replaced the technicians' printed notebooks with on-line data access from individual workstations. The group used Ful/Text from Fulcum Technologies, Inc. in Ottawa, to develop an article browser, which contained a knowledge base of more than 40,000 articles addressing everything from handling a broken printer driver to calming an irate user.

Users said the move has already paid off. "The PSS is noticeably better than it was a year ago," said Suzanne Hale, a senior technical writer at Sierra Health Services, Inc. in Las Vegas. "I also needed to do some heavy digging about enhancements in Word 2.0, and they didn't seem to have any difficulty getting it. They got the information real quick."

Last April, Microsoft beefed up its old one-size-fits-all Online support package, a multitiered subscription service that allows users to customize support options. That service now includes three levels of support: Solution, Professional and Premier.

The Solution level is a "pay-as-you-go" service for customers needing occasional technical assistance, while the Professional option provides unlimited service requests, 24-hour callback and telephone support. Premier class service includes unlimited phone support and four-hour callback, and it assigns a senior technical engineer to each account. Basic subscription rates range from $795 to $15,000, depending on configuration. All three levels include the Online for Windows package, which allows developers to electronically query Microsoft's support staff.

The improved customer services, however, are likely to take a bite out of Microsoft's bottom line. "It's a much-needed move, but it's going to be a costly one because support people aren't true revenue generators," said Robert Kleiber, a research analyst at Piper, Jaffray & Hopwood, Inc. in Minneapolis.

Keeping lines open

Microsoft says it has made steady progress in reducing the average delay in answering a support call and in increasing the number of calls it can handle

Microsoft product support

	1/91	4/91	7/91	*FY '92
Calls received per day	9,400	8,900	10,700	14,000
Calls handled	7,400	7,600	10,300	14,000
Average delay (in minutes)	4.4	3.5	1.5	<1.0

*Projected

Source: Microsoft Corp. CW Chart: Janell Genovese

Interleaf strategy focus of Products Advisory Council

BY CAROL HILDEBRAND
CW STAFF

WALTHAM, Mass. — Users made their annual trek to the groves of Interleaf, Inc. last month as the third annual Products Advisory Council met to share praise, problems and advice.

David Weinberger, director of strategic marketing at the $84 million desktop publishing company, said the meeting afforded the approximately 30 users an opportunity to hear the company's strategic plans and offer input on where they would like to see products heading. "We presented our plans at a very high strategic level for addressing publishing and information management," he said.

The feedback is intended to help the company better focus on those products generating user interest, as well as work on current product glitches people want to see fixed.

Larry McLain would like more networkability on Viewstation, for example. McLain, manager of sector electronic publishing at Motorola, Inc. in Tempe, Ariz., uses the tool to share technical documentation on-line with clients.

"Right now, the product assumes that everyone is on the same LAN," he said. "People need to dial and use the tool, and I don't think at this point that they support that."

Tighter integration with computer-aided software engineering tools is what Don Wood, supervisor of service creation platforms at AT&T Bell Laboratories, would like to see from Interleaf tools. "I would like to be able to bring information from several different CASE tools into one document and integrate that information with database information," he said.

Other areas provoking interest, according to Weinberger, were standard generalized markup language, a government-mandated standard for document exchange that he said about 30% of the users present were interested in, and something called active documents. Weinberger described them as documents with extra intelligence built in, enabling them to access information on a network and then act on the data, for example, by computing an SQL query or running a database search.

Weinberger maintained that participants brought away a positive feeling from the council meeting, and McLain agreed: "I find them in front of the industry in industrial-strength desktop publishing, and I got the same sense from the other users."

Nightmare Scenario #2

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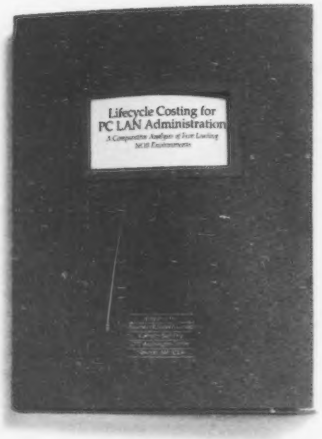

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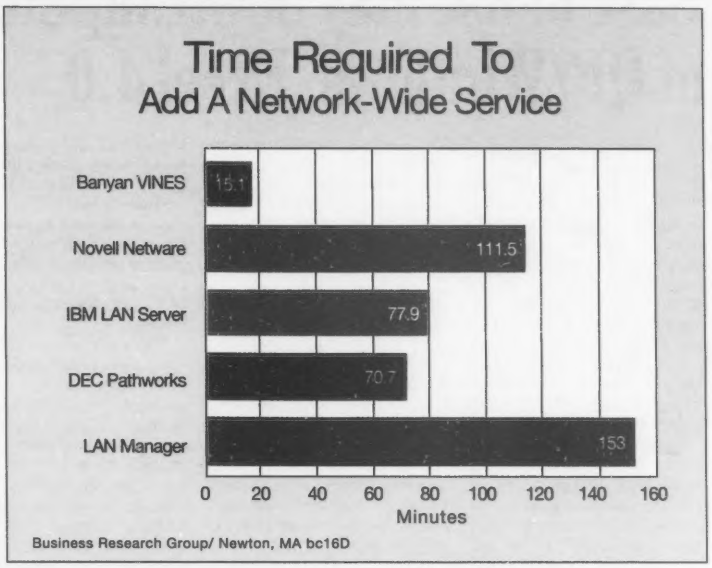

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COMMENTARY

Jesse Berst

The lowdown on OS/2 2.0

In the last installment, I updated you on Windows NT, the high-end operating system under construction at Microsoft. This time, I'd like to bring you up to date on OS/2 Version 2.0, which IBM has claimed will be "a better DOS than DOS" and a "better Windows than Windows."

IBM shipped a limited availability (LA) version of OS/2 at the end of 1991. It has promised to send out a general availability (GA) full release in March.

Is OS/2 2.0 for real? I've spent the last few weeks seeking a consensus from developers and OS/2 beta testers. Unfortunately, consensus is hard to find whenever the IBM vs. Microsoft issue comes up. I haven't heard people this worked up since the Persian Gulf war.

Despite the sandstorm of emotion, I've been able to navigate my way to some answers. Here's where OS/2 stands:

▶**Delivery.** IBM will come very close to its end-of-March deadline for GA shipment. My sources tell me the company is meeting most of its internal schedules.

▶**Stability.** LA is an order of magnitude better than its predecessors. It still suffers from dozens of quirks and glitches, but basically, it's "pretty stable," according to tester George Oliver, manager of information delivery technology at Royal Bank of Canada, which runs about 20,000 workstations and 1,000 LANs.

"Version 2.0 is stable enough right now that we're taking it into production for a pilot program," says Oliver, who plans to eventually move all of the servers to OS/2.

▶**Feature set.** LA included DOS and full-screen Windows compatibility, as well as the Workplace Shell, a new icon-oriented user interface. But LA was missing some features users say they need.

Can IBM add these features by March? Oliver claims he's seen the so-called "seamless Windows" (Windows programs in a resizable window) up and running already. I personally expect the GA release to ship with seamless Windows, full support for Object Linking and Embedding and multimedia and the new 32-bit graphics engine.

▶**Concerns.** Users are understandably wary of several potential problems, including IBM's admission that it won't be doing much more outside beta testing.

Not everyone is as worried as I am about this lack of external testing. "IBM has 7,000 internal testers," claims consultant David Moskowitz, president of Norristown, Pa.-based Productivity Solutions. Moskowitz says he's "cautiously optimistic" about the March shipment based on his experience with the LA beta version.

Even though I expect the March release to be peppered with small bugs, I also believe IBM will revise the product within three to six months. In addition to bug fixes, I think IBM will quickly add support for Windows 3.1.

Another area of concern is the learning curve. The new Workplace Shell doesn't have the same drop-down menus and other conventions popularized by Windows. As a result, most users go through a period of "paradigm shock."

Once they get over the shock, however, most users seem to prefer the new shell. University of Wisconsin LAN administrator Mark Bakken says it is "similar to the Macintosh environment. The shell makes it easy for our users to work on their PCs without being PC experts."

So far, OS/2 is definitely a better DOS than DOS. As Bakken put it, "It is nice to finally have an operating environment that can run multiple DOS applications, as well as OS/2 applications, without locking up the PC."

Is it a better Windows than Windows? Yes and no. By the time it ships, it will be better than Windows 3.0 because it is less prone to crashes. However, Windows 3.1 is significantly more stable and will erase much of that advantage when it appears in April.

From my vantage point, OS/2 2.0 won't make much sense for the average PC desktop. Its lengthy install process and high requirements for disk space and memory aren't justified for the average user. But on servers and high-end Intel-based workstations, OS/2's 32-bit operations and multitasking will provide real advantages. Indeed, those are the same kinds of advantages that make Windows NT such a compelling idea. NT, however, isn't officially due until the end of 1992, giving OS/2 an edge if it ships on time.

OS/2 Version 2.0 may not be an operating system for the masses, but it is maturing into a valid alternative for servers and workstations.

Berst is the publisher of Redmond, Wash.-based "Windows Watcher" newsletter, a monthly briefing service for software executives and corporate technology managers.

Ease of use may be strong suit of QP/Windows, Excel 4.0

BY CHRISTOPHER LINDQUIST
CW STAFF

With the release of Quattro Pro for Windows and Excel 4.0, both expected sometime later this year, Borland International, Inc. and Microsoft Corp. will look to extend a technological lead over Lotus Development Corp.'s 1-2-3 for Windows.

However, extra features may take a backseat to usability and ease of development, according to users and analysts.

Users will be looking for common features that are easier to use and easier to train for. In that vein, the potential additions to Excel 4.0 may be of more importance than Object Linking and Embedding (OLE) and Truetype support and the new Scenario Manager.

Users expect a Word for Windows-like tool bar, full 1-2-3 macro compatibility, expanded Lotus Help functionality and Wizards and built-in interactive teaching tools.

Similarly, such Quattro Pro features as a "notebook" metaphor for spreadsheets and the "property inspector" feature — in which a right mouse-button click brings up options rather than pull-down menus — may prove attractive to users who are tired of feature wars and just want things to be easier to use.

Vendors will need to heed that call if they are going to dent the Windows spreadsheet market, according to analysts. Windows competitors can score points in usability by making the most common and valuable features easier to access.

Supporting that view is John Tarbox, president of Canaan Analytics, Inc. in New Castle, Del. Users "don't choose Excel vs. 1-2-3 based on spreadsheet features alone," he said. "For a Windows user, they're going to look at [1-2-3 for Windows] and just say it's not a good Windows application."

"Ease of use is what we're concerned about," said Sheldon Laube, national director of information and technology at Price Waterhouse in New York.

Other priorities

Laube said that total compatibility with Lotus 1-2-3 macros and worksheets is a also a priority. He said the company is currently evaluating Windows spreadsheets and plans to make a decision by this summer. That decision could mean the sale of 17,000 copies for some vendor.

However, ease of use is not everything. In an increasingly connected systems world, having multiple programs work together is also vital. Tarbox noted that Microsoft defined interoperability under Windows, a fact that gives them a significant advantage in some shops.

One such shop is 3M Co.'s Commercial Office Supplies Division in St. Paul, Minn. MIS manager John Winterhalter said he does not base his buying decisions on features as much as on the core technology around which a product is built, such as Dynamic Data Exchange (DDE), OLE and electronic-mail functionality.

"We can't move off center because we're looking for all these core functionalities," — functionalities Microsoft offers him, he said. "I give Lotus a high mark for understanding the importance to us to have a Windows interface, but from a strategic standpoint, Microsoft has the lead," he said.

However, such strategic advantages are not always enough to win users.

Larry C. Winn, applications development manager at the Georgia Power Co. in Atlanta, said that while having a suite of Windows applications, including spreadsheets, from one manufacturer would be the best situation from a development standpoint, the reality of retraining many 1-2-3 users outweighs the advantages.

"We're going to use 1-2-3 for Windows," Winn said. "From a development standpoint, looking at a suite of products, it offers a lot of opportunity to integrate software through DDE or OLE. Unfortunately, the real world just isn't like that."

Solar-charged notebooks keep explorers on track

BY MICHAEL FITZGERALD
CW STAFF

It sounds like something you would see advertised on late night television: "Now the new Schlockco solar notebook charger lets you leave your 27,000-ft extension cord at home!" But what would be considered a bad advertisement has actually helped two groups of explorers use computers as they investigated remote areas of China, thanks to solar-rechargeable notebook computers provided by AST Research, Inc.

One was a group of U.S. mountain climbers that used a specially adapted Premium Exec 386SX/20 to keep track of supplies for the 30-day climb up Cho Oyu — the world's sixth tallest peak at 26,906 feet and one never before climbed by Americans.

The other notebook computer was used by How-Man Wong, president of the China Exploration & Research Society (CERS), to gather data and manage equipment on a four-month trek through Chinese deserts, undertaken in preparation for a 1993 NASA Shuttle Imaging Radar flight.

CW Illustration: Michael Siggins

Both exploration groups used a Premium Exec that came with a specially designed external charger. The charger connected to a 1.8-pound, 17.63- by 10.63-in. solar panel, which was then used to recharge the batteries as they ran down. AC power is an unknown commodity in areas such as the Gobi Desert.

AST engineer Roy Tanikawa designed the solar recharger at the request of CERS, and the company donated the computer equipment to both groups.

Mac Powerbooks: Solid, capable, compatible

Technology Analysis — A roundup of expert opinions about new products. Summaries written by freelance writer Emily Leinfuss.

Apple Computer, Inc.'s long-awaited Powerbook notebook personal computers sacrifice some features of their desktop siblings but offer Macintosh users a compatible alternative to non-Apple notebooks.

Performance: The Powerbooks, solid and capable, run at about 80% of the speed of most comparable desktop machines, as a result of a slow screen refresh rate.

Ease of use: Apple, in general, has done a good job of minimizing ergonomic compromises in the design of screens, keyboard and input devices. However, the built-in trackball, a substitute for the mouse, is harder and more awkward to use.

Power supply: The Powerbook 140 and 170 use nickel-cadmium batteries, which last two to three hours. The Model 100's lead-acid battery is about 50% heavier.

Design: The Model 100 is 1¾ pounds lighter than the other two machines because it has no internal floppy drive. Both the 140 and the 170 models weigh 6.8 lbs.

Value: In general, the Powerbooks are solid Macintosh choices for the size and cost, ranging in price from $2,299 to $4,500.

Apple Macintosh Powerbook

Reviews	Performance	Ease of use	Power supply	Design	Value	Overall
Mac Week 1/16/91	Good	Very good	Good options	Minimizes compromises	Very good	A revolutionary change
Macworld 12/91	80% speed of desktops	Murky screens, mushy keys	NC	NC	Competitive prices	Portable computing now a reality
PC Computing 11/91	NC	Unusual keyboard arrangement	NC	Standard form factor	Street prices under $2,000 to $4,000	Better than the Macintosh portable
Users						
Cynthia Harriman, Consultant	■■	■■	■■	■■	■■	More than meets expectations
Ben Calica, Industry analyst	■■	■■	■■	■■	■■	Love the weight
Analysts						
Cheryl Currid, Currid & Co.	■■	■■	NC	■	■■	OK but heavy
George Thompson, Datapro Research Corp.	■■	■■	■■	■■	■■	Ergonomic design
Andy Seybold, Dataquest, Inc.	■■	■■	■■	■■	■■	Hottest product
Mike Kelly, Techtel Corp.	■■	■■	■■	■■	■■	Finally a good Macintosh portable

Key: ■■ Very good ■■ Good ■ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Vendor financial ratings

Analysts	Long-term stability	Short-term performance
Brian Fernandez, Catalyst Associates, Inc.	■■	■
Laura Lederman, William Blair, Inc.	■	■■

Apple reported revenue of $6.3 billion for fiscal year 1991. Profits were $310 million, a 40% decline. For the first quarter of 1992, the company reported revenue of $1.86 billion and income of $166 million, a 9% increase.

Apple responds

Bruce Gee, product manager for Powerbook:

Ease of use: In regard to the trackball, keyboard and so on, those are personal preferences. Apple has done extensive user testing, and those features were found to be very comfortable.

Design: While there is no video out port, there are third-party products that give even better video out capabilities than DOS notebooks.

Mastersport: First 386SL-based notebook

Zenith Data System's Masterport 386 SL

Reviews	Performance	Ease of use	Power supply	Design	Value	Overall
Infoworld 9/16/91	Excellent	Excellent	Very good	Very good	Very good	8.0*
Byte 12/91	Fast 32-bit CPU	Advanced power conservation	First to use power-saver chip	Construction quality better than most	Excellent buy with dealer discounts	Full-featured; no holds barred
PC Week 8/26/91	Quick execution of functions	NC	Operating mode saves power	Ensures reliability	NC	A step forward
Users						
Celeste Dunne, Slate Corp.	■■	■■	■■	■■	■■	Great focus on performance
Tom Davis, Microsoft Corp.	■■	■■	■■	■■	■■	'I love it'
Analysts						
Cheryl Currid, Currid & Co.	■■	■■	■■	■■	■■	Good machine
George Thompson, Datapro Research Corp.	■■	■■	■■	■■	■■	First of its kind
Andy Seybold, Dataquest, Inc.	■■	■■	■	■	■	Fair entry, not extraordinary
Mike Kelly, Techtel Corp.	■■	■■	■	■	■■	Just another one

Key: ■■ Very good ■■ Good ■ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment. **Infoworld* rating based on 1-to-10 scale.

Vendor financial ratings

Analysts	Long-term stability	Short-term performance
Brian Fernandez, Catalyst Associates, Inc.	■	■
Rick Martin, Prudential Securities, Inc.	■■	■

Zenith Data Systems is a subsidiary of Groupe Bull and does not release separate financial data.

Zenith Data responds

Margie Silha, product marketing manager:

Ease of use: The clock stops because of a problem with running Windows on the SL chip. We have made a temporary patch available on our internal bulletin board and on Compuserve.

Value: Zenith's first approach to service is localized, where regional technical support staff works closely with resellers.

Zenith Data Systems has gained a step on its competitors by introducing the first notebook that uses Intel Corp.'s 80386SL chip, which allows a new operating mode and power management functions.

Performance: The Mastersport 386SL boasts excellent speed, partly because of its 64K random-access memory cache. It comes loaded with features, including a 20-MHz 386SL CPU, 2M bytes of 80-nsec RAM (user expandable to 8M bytes) and a 60M-byte hard drive with 19-msec average access time.

Ease of use: Mastersport's power management capabilities let it go into "standby" or "rest" modes even when it is deep into Microsoft Corp.'s Windows applications. The system resumes where the user left off. However, if the system is put to rest when in Windows, the system clock stops (see vendor response).

Power supply: Battery life under moderate to heavy use is about average. According to one report, the battery lasted two hours and 23 minutes after continuous use; according to another, four hours and two minutes — compared with Zenith Data's claim of eight hours if used intermittently.

Design: The notebook is about average in weight and size.

Value: The list price for the Mastersport 386SL is considered high at $4,999.

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ing never before $890* terminal.

Now stare here.

Introducing the WY-325 color terminal for only $890. (Yes, you can believe your eyes.) It's ergonomically advanced. It emulates general-purpose terminals such as DEC, ADDS, TeleVideo and, who would have guessed, Wyse. And the WY-325 replaces a monochromatic terminal without making changes at the host computer or to the application. Although this list of benefits could go on, the price alone should color your thinking about terminals. If so, call your local distributor or call us at 1-800-GET WYSE.

WYSE

Slow market for multiprocessors

CONTINUED FROM PAGE 37

Dzubeck, is the lack of applications.

"This thing will be slower than people think because you have a legacy of applications out there — a raft of applications on VAXs, a raft of them on AS/400s — and they're very germane to the hardware of these machines," he said.

Value-added resellers "are being courted, and they see the opportunity, but they're running at their own pace, not the vendor's. Multiple platforms cost money to maintain and to test. As applications spread, so will the machines," Dzubeck added.

Vendors such as AST Research, Inc., which hired a number of minicomputer engineers to help ready its first multiprocessor, agreed that the market could be slow in coming. AST is one of several vendors that has tried to forge a multiprocessing standards consortium.

"What we're really trying to do is ignite a market," said Michael Krieger, a senior manager of advanced products marketing at AST. "The things that made the PC industry so successful are missing, such as standards in the areas of shrink-wrapped operating systems and standard expansion and I/O buses."

Krieger said AST aims to ship a four-processor product in the spring, regardless of whether standards develop.

Without standards, or at least more stable products, vendors might find users yawning at the prospect of multiprocessing. Baxter's Purcell, for instance, said multiprocessing holds little interest for Baxter right now because there are no multiprocessing operating systems that will operate an on-line transaction-processing environment.

"Multiprocessing is nice, but it doesn't fix what we need, which is a production-quality open operating system," Purcell explained. Purcell said OS/2 is not there yet, while Microsoft Corp.'s upcoming NT appears to be a proprietary system, and Unix's requires a radical shift in infrastructures.

Purcell added that Baxter, which has two Systempros for each LAN, one as the primary server and one that acts as a backup system, has examined multiprocessors as a way of consolidating but has no plans to do so at this time.

Yet for George Roukas, director of systems at a major financial services company in New York, multiprocessing is a reality.

"It's there, you can buy it, it works," he said. Roukas said his company continues to evaluate a system from Parallan, and he said the superserver type of environment certainly holds significant interest for his company.

"I think they are going to become more popular, simply because when companies make shifts — say the ones that have downsized applications from mainframes — they'll discover they need the kind of security these systems offer," Roukas said.

Besides cost advantages, he cited the ability to have remote maintenance processors, redundant arrays of inexpensive disks storage and general redundancy.

Mission-critical tools are taking aim at desktops

CONTINUED FROM PAGE 37

some initial successes.

At Stroehmann Bakeries, Inc., the IS department is using in-house programming to develop applications for an OS/2 platform. "Most of our programmers have a mainframe background, so from our mainframe standpoint, OS/2 is much more like a mainframe than a PC, which gives us a comfort factor," said Steve Morrison, Stroehmann's manager of end-user computing. "It has true multitasking, and it works."

Another shop is using a development and runtime environment from Cooperative Solutions, Inc. to create applications. Moog Automotive, Inc. selected this package because it allows the company to quickly develop core systems on a desktop platform, said Terry Smith, vice president of IS.

Since installing the development tools in October, the company has developed a warranty and repairs tracking system and a sales tracking system for the desktop platform. A third system is under development for on-line order entry.

"I guess I am downsizing, [although] our strategy has nothing to do with downsizing," Smith said. "It has to do with rapidly supporting business functions."

Roberts at Unum said it is an ongoing concern that desktop-based applications have mainframe-class functionality.

"There are concerns, but we are doing things you can't do on a mainframe," Roberts said. "We are delivering functions and technologies that would be too expensive to do on a mainframe and wouldn't be user-friendly."

Math Works upgrade is two steps ahead

BY MARYFRAN JOHNSON
CW STAFF

WOODS HOLE, Mass. — Peter Shaw was expecting "another ho-hum incremental upgrade" when he recently unwrapped his beta-test version of Matlab, a popular scientific visualization and numerical computing application from The Math Works, Inc. in Natick, Mass.

Instead, what the associate scientist at the Woods Hole Oceanographic Institution found was vastly expanded software that provides advanced graphics, animation and three-dimensional capabilities.

"They took a huge leap with this version of Matlab, improving it by at least a factor of two," Shaw said. "Users have been hammering on them for [the ability to create] 3-D axes, but they added colors and image analysis as well. They went a long way for day-to-day visualization of data."

Worldwide variety

Matlab has some 100,000 users worldwide in a variety of scientific and engineering fields at research universities, government installations and companies such as 3M Co., AT&T Bell Laboratories, Caterpillar, Inc., Exxon Chemical Co., Eastman Kodak Co. and Rand Corp.

"This release of Matlab merges serious numeric computation software with enhanced graphics capabilities to bring scientific visualization to a new level," said John Little, president and chief executive officer of Mathworks.

Matlab Version 4.0 added enhanced two-dimensional and 3-D color graphics, new file I/O capabilities, debugging tools, support for sparse matrix structures and more than 100 new mathematical and analysis functions. There is also sound output for Matlab's data matrices but only on a Sun Microsystems, Inc. Sparcstation with its built-in speaker.

At Woods Hole, which has about 100 Matlab users, Shaw said he was able to learn and use the new animation capabilities within two days. His work in the geology department focuses on analyzing topography data collected from academic research ships. "I'm able to visualize data in ways that just weren't possible before," he said.

The new version, with its 3-D capabilities, removes the need to move certain data out of Matlab for additional processing in other applications, he added. "We don't have to waste so much time moving things back and forth," Shaw said. "Now that we can do these things in Matlab, it makes it a strong candidate for standardization."

The new version will be generally available this quarter, initially under X Window System machines, including Sun Sparcstations, Hewlett-Packard Co. HP Apollo 9000 workstations, IBM RISC System/6000s, Digital Equipment Corp. Decstations and Silicon Graphics, Inc. machines. The single-user price is $2,995.

The older versions of Matlab also run on IBM-compatible personal computers, Apple Computer, Inc. Macintoshes and systems from DEC, Convex Computer Corp., Cray Research, Inc. and Alliant Computer Systems Corp. A company spokesman said Version 4.0 will be available on those platforms later this year.

NEW PRODUCTS

Software utilities

Dariana, Inc. has upgraded Winsleuth Professional and System Sleuth Professional.

Winsleuth Professional 2.0 is a software package providing system diagnostic tools for Microsoft Corp.'s Windows environment.

Version 2.0 also offers new diagnostic and troubleshooting features; it includes DOS-level analysis of memory addresses, interrupts, I/O port usage and memory usage by terminate and stay resident programs.

System Sleuth Professional 4.0 provides diagnostic tools for personal computers running DOS. It has been redesigned with pull-down menus, new benchmarking tests and diagnostic modules and an Installation Assistant module that simplifies installation of sound, display and networking devices on the PC, according to the vendor.

The products cost $169 each.

Dariana
S-278
7439 La Palma Ave.
Buena Park, Calif. 90620
(714) 562-5777

Softsource Co. has announced Drawing Librarian for Sun, a software package allowing Sun Microsystems, Inc. workstation users to view Autocad files.

Users can put revision notes on the drawings without altering the original files; redline comments are placed in a separate file. The product also provides zoom, pan and rotate functions.

The cost is $1,000 per workstation.

Softsource
301 W. Holly St.
Bellingham, Wash. 98225
(206) 676-0999

Precise Electronics has released Uni-Zip, a data compression archiving utility for Sun Microsystems, Inc. Sun-4 workstations.

Uni-Zip archive files are compatible with Pkware, Inc.'s Pkzip compression product for DOS; Uni-zip and Pkzip files are interchangeable, according to Precise Electronics.

Uni-Zip also provides a high compression rate and security features.

The product costs $179 for one workstation.

Precise Electronics
31 Englewood Ave.
Brookline, Mass. 02146
(617) 566-6867

Macintosh products

Storage Dimensions, a subsidiary of Maxtor Corp., has announced two erasable optical storage devices for use with the Apple Computer, Inc. Macintosh.

The Macinstor 128EO is a 128M-byte, 3½-in. drive with 40-msec average seek time. It costs $2,299.

The Macinstor 1000 is a 1G-byte, 5¼-in. subsystem with a maximum data transfer rate of 1M byte/sec. It is priced at $7,045.

The company also announced the Macinstor Tape 2000, a digital audio tape subsystem with a 2G-byte capacity, for $2,999.

Storage Dimensions
1656 McCarthy Blvd.
Milpitas, Calif. 95035
(408) 954-0710

Software applications packages

Andyne Computing Ltd. has announced a Microsoft Corp. Windows version of its Graphical Query Language (GQL).

GQL is a set of ad hoc query and report tools for SQL databases. It provides a point-and-click interface for queries and lets users store frequently used report forms.

The price is $350.

Andyne Computing
2nd Floor
552 Princess St.
Kingston, Ontario K7L 1C7
(613) 548-4355

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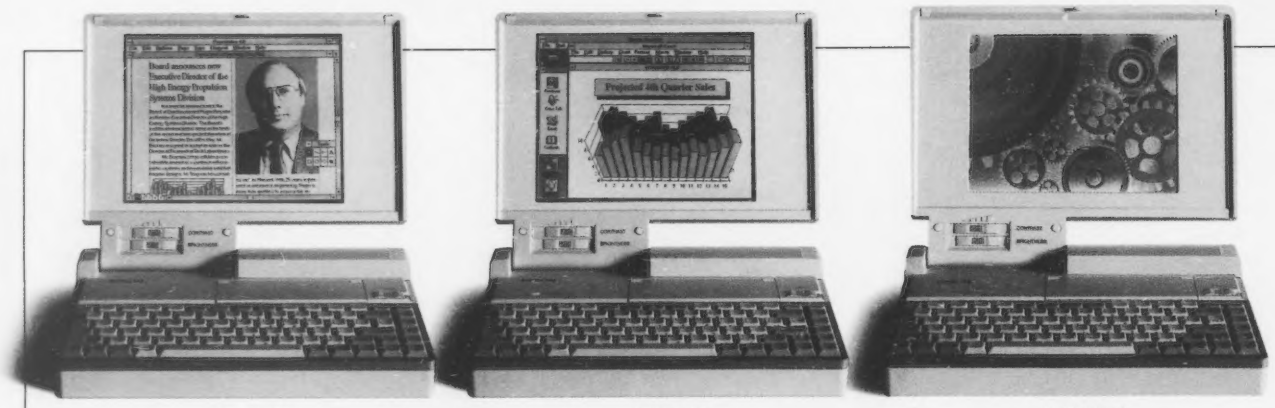

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The Epson® NB-SL™ series. A new line of 386™ notebook computers with a long list of notable innovations: active matrix color, upgradable displays, removable hard drives, extended battery life, desktop expandability, and more.

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Feast your eyes first on the NB-SL/25C™, the world's first battery powered notebook with MIM Active Matrix color.* This exclusive Epson technology controls every screen pixel individually, producing color that rivals the quality and clarity of a desktop VGA monitor. It's not only a brilliant improvement over the passive matrix displays found in most portables, but one that finally makes the notebook a presentation-quality tool.

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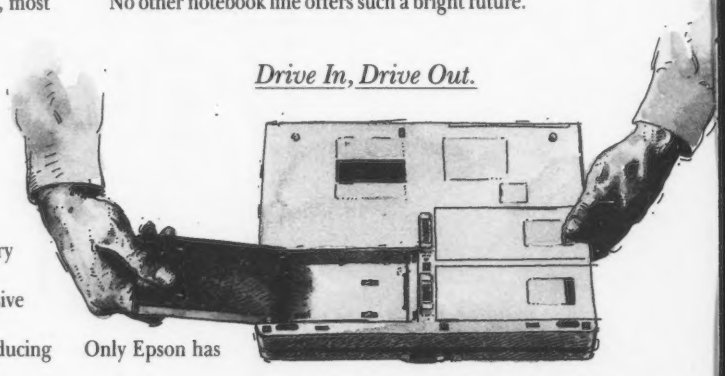

Take it or leave it—Epson's unique removable hard drive brings new flexibility to notebook computing.

Only Epson has the drive to make notebook computing more flexible than ever. These removable, pocket-size 40MB, 60MB and 80MB hard drives are easy to transport, share, or lock away for extra security. Add an optional adapter, and the same drive will fit both your notebook and desktop.

The possibilities are endless. Using their own removable drives, several employees can share a notebook without sharing data. You can even create a whole library of drives, each with its own type of data, application or operating system.

*NB-SL/25C and color upgrade available second quarter 1992. **Battery life will vary according to use. All company and/or product names are trademarks and/or registered trademarks of their respective manufacturers. Epson is a registered trademark of Seiko Epson Corp. ©1992 Epson America, Inc., 20770 Madrona Ave., Torrance, CA 90509. For dealer referral, call **800-BUY-EPSON** (800-289-3776). In Canada, call 800-GO-EPSON.

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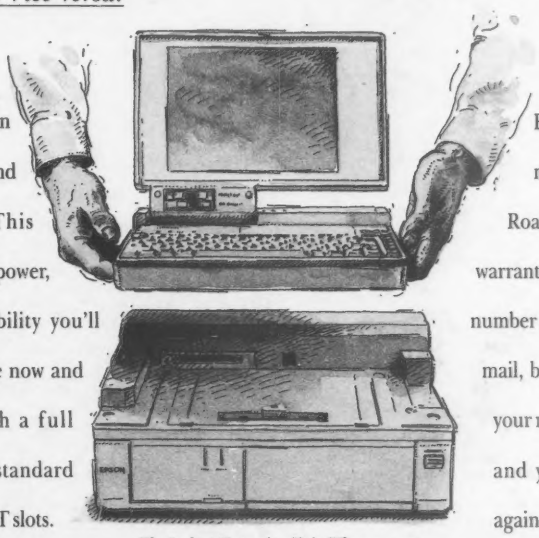

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Another powerful NB-SL advantage: it's virtually tireless. Using a processor specially designed for portables, plus Epson's innovative power management software, the NB-SL can rest when you rest, automatically shut down components that aren't in use, and even "sleep" up to a week, waking automatically to take incoming faxes and E-mail. Best of all, with normal use it will run up to six hours on a single charge.**

Wherever You Go, There We Are.

Even the service and support behind these notebooks is noteworthy. Our unique Extra Care Road Service,℠ free while your NB-SL is under warranty, puts expert technical assistance just an 800 number away. Anything we can't fix by phone, we'll fix by mail, by sending a replacement the next day. Pop in your removable hard drive and you're ready to go again, without losing any precious data—or much precious time. It's an extra measure of security that only Epson can provide.

To experience the NB-SL's innovations in living color, visit your nearest Epson dealer, or call 800-289-3776 for our free brochure. And see how we've rewritten the book on notebooks.

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NETWORK SHORTS

Carriers try out frame relay

Three carriers said last week they have begun a three-month interconnection test of frame-relay service. **Wiltel, Nynex Corp.** and **Southwestern Bell Telephone Co.** are linking their respective laboratories in Tulsa, Okla., St. Louis and White Plains, N.Y., via Wiltel's public Wilpak service. Nynex and Southwestern Bell said they expect to offer frame-relay service in parts of their regions by mid-1992.

The **Wall Street Telecommunications Association**'s Disaster Recovery "Hot Site" Consortium has awarded a contract to **Contingency Trading Facility, Inc.** and **Metropolitan Fiber Systems, Inc.** to build a common, trading-capable disaster recovery facility in Brooklyn's Metrotech Center. Slated to back up 250 trading seats, the facility is targeted for completion within a year. It will serve multiple firms.

Network service providers **Infonet** and **Sears Communications Co.** have linked their electronic data interchange services to allow more groups of multinational trading partners to exchange business documents electronically.

Directory services looking up

Vendors vie for users as indexes become essential tools in global systems

ANALYSIS

BY JIM NASH
CW STAFF

Above the din of network managers' demands rises a call for global directory services. For some personal computer networking vendors — including market leader Novell, Inc. — that shrill and unwavering call is becoming irresistible.

Vendors are working to respond to managers' demands for directory services that require the minimum amount of manual work, are flexible enough to add information needed by specific firms and are standard to the greatest possible degree. Those with directory services, such as Banyan Systems, Inc., are expanding their capabilities.

Novell currently lacks a comparable system but is scrambling to introduce one, possibly as part of Netware Version 3.2, slated to ship this year.

"Global directory services make large networks possible," said James Brentano, senior local-area network specialist at Pacific Gas & Electric Co., a Banyan shop in San Francisco. Without them, he said, users can get lost looking for resources in the dark.

When most networks were communities of less than a dozen users that had little ambition to grow much larger, it was relatively easy to discover who and what was on each system. But those same networks are expanding and becoming nodes in massive PC networks.

A global, or companywide, directory service is needed for these larger networks in the same way a phone book is necessary in cities. It points users to resources without requiring them to know exact addresses. For administrators, it can make organizing resources on whole networks a matter of maintaining a single database.

Yet for all the simplicity that directory services provide to people using a network, they are complex animals to create. To date, the model to match has been Banyan's Streettalk.

With Streettalk, workers on a Banyan Vines LAN log onto the entire network — not to individual servers or groups of servers. Vines, said Chris Stormount, director of network applications services at Vines-heavy Bank of Boston Corp., looks at all Banyan networks as a single logical network.

Novell, in contrast, requires end users to log onto physical devices grouped into domains. These domains are currently part of the Provo, Utah-based company's Netware Naming Service.

That utility allows a maximum of eight servers to be grouped in any logical fashion by network managers.

For network managers, the difference means expending time and resources. Vines, a logical network, generally requires less support because there is one central directory to maintain. A large Netware installation may

Continued on page 56

Solo links on local loop are network weak spot

BY JOANIE M. WEXLER
CW STAFF

An Achilles' heel may lurk even within corporate wide-area networks designed with plenty of diverse paths for redundancy protection, according to some users who have looked into fortifying their networks in the local loop.

The last leg of a switched network connection traveling from a local telephone company's central office to a customer's premises is usually a solo link because the local carriers tend to serve a given customer out of a single central office. This means that most long-haul networks, reinforced with backup paths from one or more carriers, turn vulnerable in the local loop.

"Ninety-nine percent of all facilities in the U.S. are in this situation; they just don't think about it," said David A. Bittenbender, chief of the telecommunications branch at the U.S. Environmental Protection Agency (EPA) in Research Triangle Park, N.C.

Even alternative carriers providing competitive network services tend to hook into a regional Bell operating company's local-exchange central office for the last leg of switched service, according to Tom Nolle, president of CIMI Corp., a consultancy based in Voorhees, N.J.

When looking to independent carriers such as Metropolian Fiber Systems, Inc. or Teleport Communications Group for network diversity, "the question is, 'How many paths do you have between [that carrier's network] and wherever it is you're trying to go?' If they hook into the local-exchange network and rely on that only, you haven't changed your diversity at all," Nolle said.

Doug Vande Zande

Bittenbender: *'They just don't think about it'*

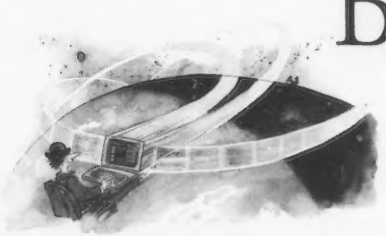
Users must also keep an eye out for this problem when designing long-haul networks using multiple carriers for protection, as carriers have been known to lease network segments from each other.

Nolle added that he has seen several network failures in companies that spent large amounts of money for local loop diversity, then ran those links through the same conduit into their building, exposing both paths equally to backhoes and other network outage culprits.

To negotiate a redundant path from the local Bell carrier could cost "tens of thousands of dollars" up-front, and monthly costs "would be orders of magnitude more than present costs," Nolle estimated.

The practicality of building extra links in the local area depends greatly on whether the local carrier has an-

Continued on page 56



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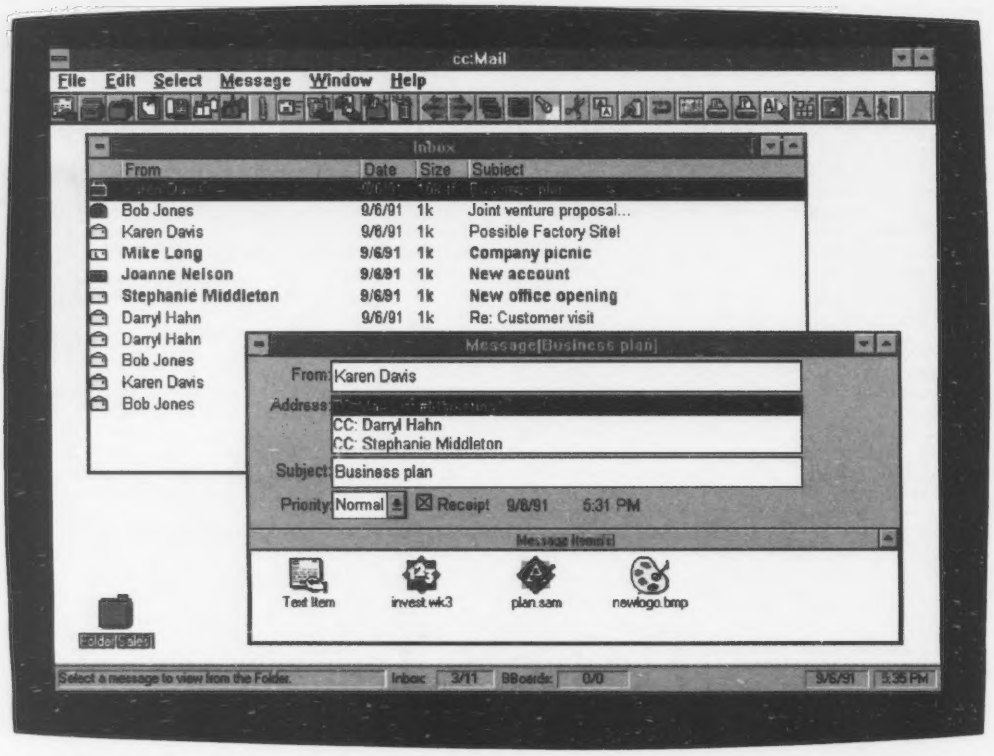

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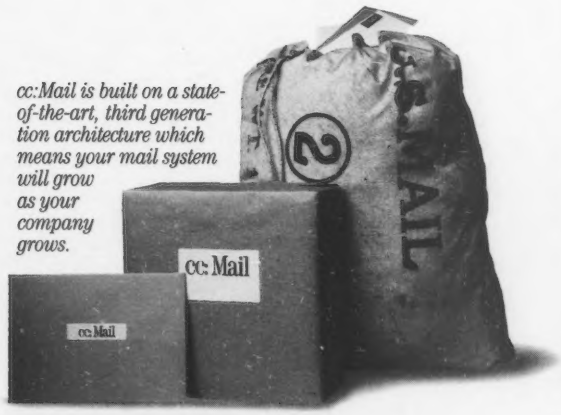

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FMC moves global traffic to private net

BY ELISABETH HORWITT
CW STAFF

DALLAS — While many companies are choosing to put their global networks in the hands of value-added network providers, FMC Corp. is taking the opposite tack. The $4 billion conglomerate recently decided to move its overseas data transmissions off BT North America's packet-switched network and take its voice off public dial-up lines.

Both types of traffic will move to a private network based on switches, multiplexers and compression equipment from Republic Telecom Systems in Boulder, Colo.

"The amount we were spending on public networks plus messengers and couriers for machine drawings started growing to the point where we were able to pass corporate hurdles and meet the return-on-investment critieria needed to justify our business plan for a [dedicated] European network," said Phillip Evans, the company's director of telecommunications.

System overburdened

Indeed, FMC had reached the point where its overseas traffic was getting to be too much for BT's network to handle, Evans said. The company's current BT circuits support 64K bit/sec.; however, users often must access the network at much lower rates, depending on local line speeds supported by various European telecommunications authorities, Evans said.

In contrast, Republic Telecom's multiplexing equipment will eventually link 21 European sites at speeds from 64K and 192K bit/sec., Evans said. The equipment does this by amalgamating up to three 64K bit/sec. dedicated lines into a single trunk. Data traffic will be handled by a combination of Republic Telecom multiplexers and Cisco Systems, Inc. routers.

In addition, the multiplexers will be equipped with compressors that provide 10-to-1 voice compression — soon to increase to 12-to-1 — and fax and data compression of up to 4-to-1, Evans said. This will enable FMC users to put as many as 12 simultaneous voice and fax transmissions on one 64K bit/sec. circuit "so we can derive four to 12 times the usefulness out of the fixed investment of one 64K bit/sec. channel."

FMC expects to recoup its outlay on capital equipment and services within three years, Evans said. A large portion of the cost savings will come from blending voice, data and fax on the same links instead of having separate links for each type of traffic. In addition, the added bandwidth will enable FMC sites to exchange complex engineering drawings electronically, instead of hiring couriers, Evans said.

Evans said the company has been able to justify this move on the basis of current traffic, which includes engineering drawings, financial reports, customer orders and human resource applications. Furthermore, he said, "We are confident that, as with any other enhanced communications system, the traffic will grow as users rethink the way they do business" to take advantage of the new network tools.

On-line in 1993

The sites will be linked in a mesh configuration to provide redundant routing around failures, Evans said. There will be two network "supernodes:" one in Brussels, the other in Dunfermline, Scotland. Initial installation has begun, and the project is scheduled for completion by the first quarter of 1993.

FMC's U.S. sites are connected to Europe via 128K bit/sec. links provided by AT&T and Belgium carrier Regie des Telegraphes et Telephones.

Telindus, a global network equipment manufacturer and systems integrator, will handle network installation, maintenance and servicing in cooperation with the various European telecommunications authorities, which will maintain the network, Evans said. FMC chose Telindus because of its European presence and because it is based in Brussels, the location of FMC's European corporate headquarters, he added.

In addition, Telindus recently purchased a 10% interest in Republic Telecom, Evans said.

FMC intends to keep an eye on its network through links to Republic Telecom's network management system, which will send alerts to the company's U.S. telecommunications department. "When there is a glitch, we'll see it and work with Telindus or the carriers to determine the problem," Evans said.

Directories looking up

CONTINUED FROM PAGE 53

need one administrator for each domain.

Vines also eases administration by allowing its servers to distribute the sometimes-enormous directory over several machines. Each server holds the entire database of names and locations but is directly responsible for updating only a portion of it. At preset intervals, each server tells every other server the updates it has made.

Many administrators and industry analysts agree that it is unfair to compare Netware Naming Service to Streettalk. They point out that a naming service is typically a subset of features found in a global directory.

In addition, "Netware is not architected to be a wide-area network," said Mike Ulvestad, senior consultant to Netware-dominated Hughes Aircraft Co. in Long Beach, Calif. "Servers don't know that much about services on other servers," Ulvestad said.

Not taken seriously

For those reasons, Novell's directory efforts have not been taken too seriously by some. "I have trouble understanding Novell's directory-service strategy," Stormount said.

It is not just the Vines-faithful who are at a loss when discussing Novell. Asked about the Netware naming services on his Netware-dominated network, Ray Chandler, Arco Oil and Gas Co.'s senior network consultant, said, "I don't know that there's that much to talk about." He cited confusion over what Novell intends to do as well as disappointment with present naming service capabilities.

Nonetheless, Chandler said that his Plano, Texas, office, along with the rest of Arco, is in the process of phasing out its Vines networks. He has said in the past that Netware's features, including speed and third-party support, make it the best network operating system for his firm.

He is joined by other network administrators who are willing to wait for Novell to introduce its own directory.

Streettalk's biggest problem until late last year, Ulvestad said, was that it worked only with Vines. Banyan expanded Streettalk to list all resources on Apple Computer, Inc. Macintosh networks linked to Vines.

Flexibility needed

There are other problems, as well, Stormount pointed out.

Streettalk must be made more flexible, she said. Network managers should be able to change its dependence on organizational groupings.

Bank of Boston makes organizational changes with regularity, making directory updates too frequent. The army of bank employees, Stormount explained, is almost always on the move from one department to another.

The result is that department heads are forced to delete or add names several times a month, Stormount said.

Naming services

Novell's Netware marketing director, John Edwards, said Netware Naming Service was designed to simplify the log-on process for managers and end users who must have access to a specific number of servers. To that end, Edwards said, "The naming service does a good job." Other company executives have discussed ongoing development on a global directory service in vague terms.

Future versions of either naming or directory services, Edwards said, are likely to incorporate object-oriented software. In addition, he said, Novell is "moving in the direction" of the X.500 directory standard. "We intend to have the same kind of heterogeneous [environment] for messaging, databases" and other resources that Novell offers for file and print services, he explained. All of this would require some form of global directory service.

In fact, said sources who requested to remain anonymous, Novell intends to leapfrog Banyan's Vines by including resources from other network operating systems on a future Netware directory. That would be welcome for either system, managers agreed.

JIM NASH

Solo links on local loop are network weak spot

CONTINUED FROM PAGE 53

other central office near the central office designated to serve a given customer, said Michael Kilbane, general manager of systems development at Dallas-based Diamond Shamrock Corp.

"We are serviced by one" central office, said Kilbane, who is also president of the International Communications Association. "For us to have diverse routing, we would have to contract with Southwestern Bell Telephone to have an alternate route constructed. That would be very costly."

Kilbane *uses cellular technology for backup*

In the meantime, Kilbane said, Diamond Shamrock is using cellular technology for backup, "albeit not for high volumes of data." However, he said the company has purchased a building to which it will relocate in 1994. The site is close to the serving area of two central offices, allowing the firm to get diverse routing at a reasonable cost.

Government users bound to phone service under the 10-year Federal Telephone System-2000 contract with AT&T and U.S. Sprint Communications Co. find themselves even more limited. "AT&T can give us total diversity, but when they negotiate with the local-exchange carrier for it and that carrier wants extra money, AT&T doesn't have any way to charge that back to us," Bittenbender explained.

He said he has been trying for six months to build redundancy into his Cincinnati telecommunications hub, which would cost "in the six figures." Plans to install another distribution frame — the point where the carrier's facility enters the EPA's and gets distributed — were greeted with an OK from Cincinnati Bell, "but they said they'd have to dig up six miles of the street. In the meantime, we're hoping the last six miles don't fail," Bittenbender said.

Intelligence in today's central office switches does provide diverse routing for users wishing to reroute calls to another location in the event of an outage — particularly those relying on toll-free numbers to capture business. "But this doesn't really solve the problem of keeping your own location up and running," Kilbane said.

The users and Nolle agreed that further deregulation of the local Bell companies would not likely help this situation because overbuilding local networks would result in higher costs passed on to users.

Nolle said his own client base does not reflect a high level of local loop failure, "so for most users, this isn't a problem."

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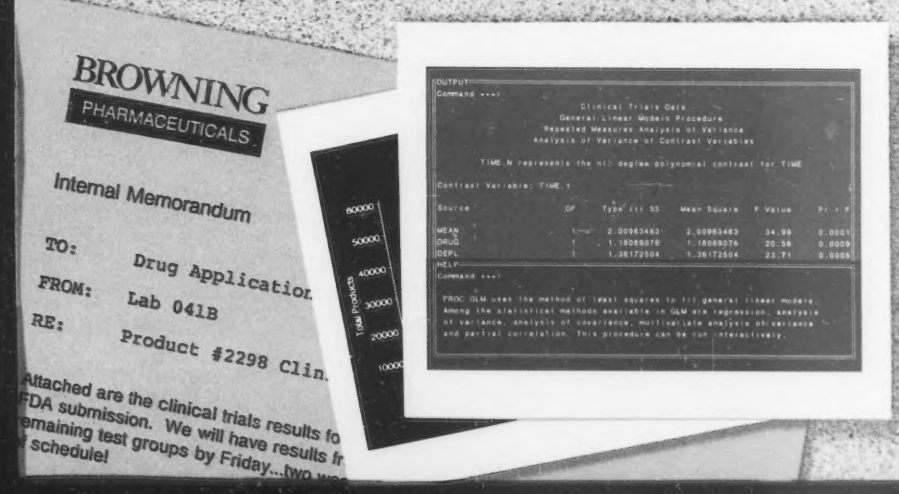

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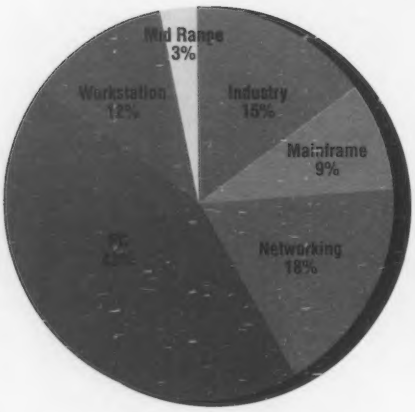

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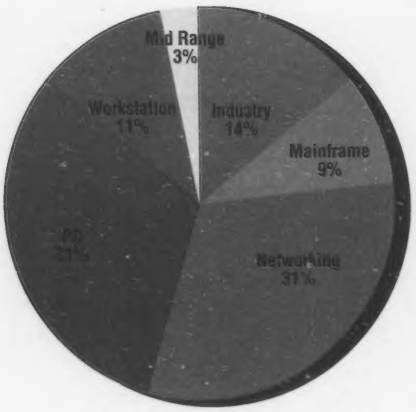

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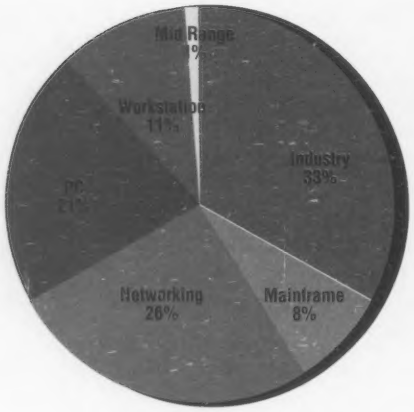

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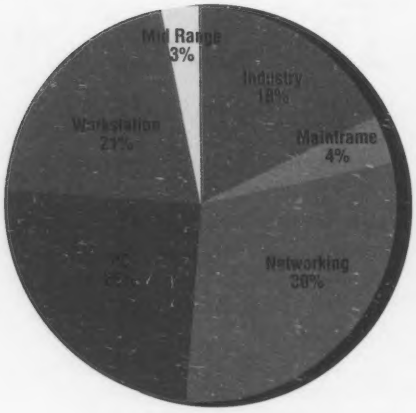

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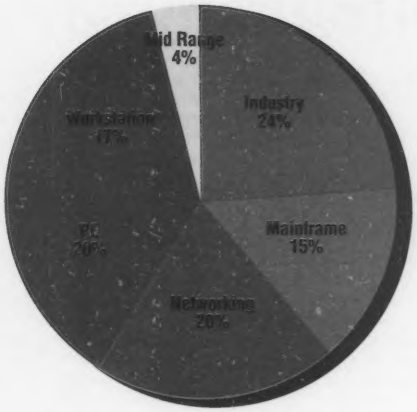

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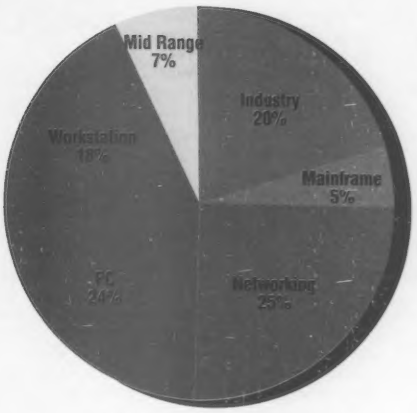

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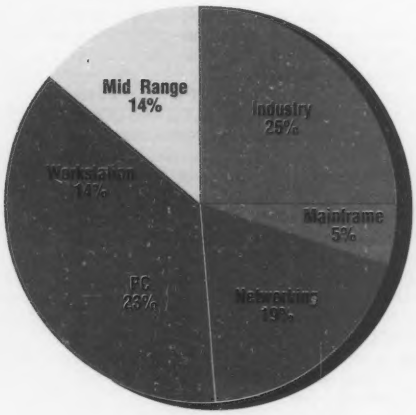

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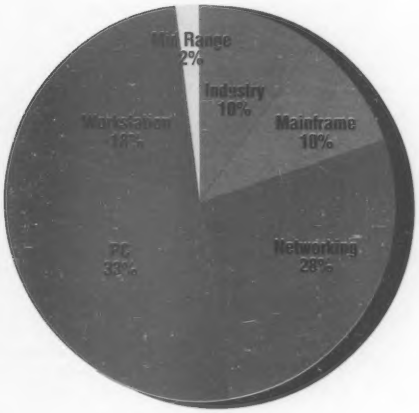

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COMMENTARY

Eli S. Lurin

Changing scenery

A recent survey of more than 300 telecommunications executives in large companies showed that a major shift will occur in how users perceive the importance of telecommunications applications during the next five years.

According to the Frost & Sullivan, Inc. survey, the most important applications for users right now involve accessing host data with a PC. However, in five years, electronic mail and PC-to-PC communications will grow to match host-to-PC communications in importance. To put it another way, users will be at least as focused on sharing data with one another as on accessing data from the corporate host.

The survey probed user opinions about how important various telecommunications applications are now and how important they will be in five years.

On a 1-to-5 scale, with 5 being the most important, PC-to-PC communications were rated a 3.7 now and projected to be 4.4 in five years. This is a reasonable result, given the rapid growth of LANs, network services and equipment, which will be used to connect LANs to each other.

While the survey showed all major applications increasing in importance during the next five years, the biggest jumps in interest were for compressed video and full-motion videoconferencing, from 2.2 and 2.0 to 3.2 and 3.1, respectively. As these technologies continue to improve in price and reliability, more and more companies are taking advantage of them as a way to bring geographically distributed personnel together while holding down travel budgets.

One implication of this report is that information systems executives should rethink how their networks will meet the needs of all business users, not just PC and workstation operators. For example, they should consider using a network to distribute video for training, for conferencing between most company locations (not only large establishments) and for reaching customers. The use of telecommunications to support field sales and employees working at home or out of the office at some other location will also become a key strategic issue.

E-mail and other types of communications are increasing in importance. Fax communications and voice mail are also becoming more important. The network should be a comprehensive messaging system for all employees, not only those in the "mainstream" of computer use. The network should be a place where the need for all customers and employees to communicate is met.

It is important that the IS department be flexible in the design and operation of its network. The applications of different users who need video and message communications may be new to the IS staff. The benefits of a good company network may not be obvious to these different users. All the details required for success may not yet be known. Plans should be made to use pilot programs and to visit other companies that use the new applications, to better understand what works and what does not.

The IS department should develop a network that is as flexible as possible to meet these needs, even if a little efficiency must be given up to do so. Be prepared to go back and do it over. The basic needs of the company must be met, and they are important enough to warrant the extra flexibility.

Lurin is president of Eljan, Inc., a consultancy in Great Neck, N.Y.

New tradition

In the next five years, PC-to-PC communications will become just as important as the traditional host-to-PC communications

Importance of applications	Present	In five years*
Host-to-PC/terminal transaction	4.3	4.4
E-mail	3.9	4.4
PC-to-PC communications	3.7	4.4
Fax communications	3.6	3.9
Public network (voice)	3.5	3.7
Private network (voice)	3.4	3.5
Voice mail	3.2	3.8
Compressed video	2.2	3.2
Full-motion video	2.0	3.1

Rating 1=Unimportant 5=Very important * Projected

Source: Frost & Sullivan, Inc. CW Chart: Michael Siggins

Fischer set to escalate LAN-based E-mail software war

BY ELISABETH HORWITT
CW STAFF

Following closely on the heels of rivals IBM and Verimation, Inc., Fischer International Systems Corp. was slated last week to introduce a local-area network version of its host-based electronic-mail system, Emc²/TAO.

The company is also expected to introduce intelligent forms-processing software for the system. The mainframe version is due to be announced this quarter, with a LAN version scheduled for later this year, Fischer spokesman Richard Viets said.

Direct attack

This is a direct attack on Verimation, which recently announced that it is developing a LAN-based E-mail and intelligent forms system under an agreement with Action Technologies, Inc. [CW, Jan. 6].

Fischer intends to go up against both host-oriented vendors such as IBM and Verimation and the LAN contingent, which includes Microsoft Corp. and Lotus Development Corp., Viets said.

Fischer's future success as an E-mail vendor hinges on its strategy to port its software to other environments and introduce mail-enabled functionality such as forms-processing, according to a recent report by Gartner Group, Inc. The lack of an intelligent forms-processing system is one of the vendor's weak points, Gartner said. The report added that the LAN product is likely to appeal primarily to Fischer's current mainframe E-mail customers.

One-fifth of market

Fischer's present system, which runs primarily on IBM VM and VSE host environments, has 19% of the U.S. mainframe-based E-mail market, according to International Data Corp. (IDC), a Framingham, Mass.-based research firm. Verimation, a late starter in the U.S., has only 3%; IBM's Officevision VM and Professional Office System collectively have 26%; and IBM Personal Services/370 for MVS has 16%, according to IDC.

Emc²/TAO is written in C and is extremely portable. "Now we are looking for target environments to port to. The most obvious is the PC LAN environment," Viets said. The company will target users who "want LAN E-mail in a big enterprise that hooks up to the mainframe," he added.

The LAN version is said to run on OS/2 servers and Microsoft DOS and DOS/Windows clients. It reportedly includes all the features of Fischer's IBM mainframe version.

An IBM LU6.2-based link gives LAN clients access to the IBM E-mail database, Fischer said. The database includes a directory of E-mail user addresses and a calendaring function for scheduling meetings. This enables a company to set up a centralized coordinator for corporatewide meetings and E-mail delivery.

Alternatively, users can set up local directories on OS/2 LAN databases, which can also communicate with one another via LU6.2 for mail delivery and meeting scheduling, Viets said. The local OS/2 database server is said to automatically route E-mail messages to other interconnected LANs if an E-mail address is not in the local database.

However, keeping each LAN database informed of changing E-mail addresses on other LANs is still a manual job, Viets said.

"We will make it automated in the future, as users are more and more distributed," he said. In the meantime, users with multiple LANs on their E-mail system may prefer the central host database, he said.

IPX support to come

DOS and DOS/Windows clients communicate with the OS/2 servers via Netbios. Support for Novell, Inc.'s IPX LAN protocol is to come, Viets said.

Also en route is an IBM Application System/400 version of Emc²/TAO, as well as a re-release of an existing Xenix version of the Emc²/TAO system from The Santa Cruz Operation, Viets said.

The LAN version of Emc²/TAO is scheduled for immediate availability; it costs $1,100.

DCE Developers Kit to debut in March

BY JOANIE M. WEXLER
CW STAFF

PITTSBURGH — The Open Software Foundation's (OSF) Distributed Computing Environment (DCE) is edging closer to the test of user acceptance.

OSF member Transarc Corp., based here, said its DCE Developers Kit will be generally available in March. It will allow user companies to start gluing together disparate hardware platforms with portable, interoperable applications.

Transarc is one of more than 100 licensees of the OSF's DCE Release 1.0 made available to OSF members last fall. DCE is an integrated set of technologies necessary for distributed computing, including naming services, remote procedure calls, distributed file services and security.

A division of Citibank NA that has been testing Transarc's value-added DCE Release 1.0 and DCE-compliant Encina on-line transaction processing application intends to use DCE to mesh old and new technology.

"We have a lot of large systems that we're not going to be replacing with small platforms," said Larry Toleshuck, vice president of financial institutions and transactional services at the New York-based bank. "DCE allows us to write code for any platform and make independent hardware and software decisions and frees us from dependence on a single vendor."

Blended with a common set of application programming interfaces, DCE software allows developers to create one application that can run across a variety of hardware platforms and interoperate. The Transarc-supplied DCE will initially link Sun Microsystems, Inc. and IBM RISC System/6000 platforms.

Toleshuck said that while he thinks DCE is a step in the right direction, he considers the software alone an insufficent platform for building distributed transaction-processing applications. He said the software leaves the programmer a lot of coding to do when, for example, building in reliability, checks and retries in an electronic funds transfer application.

Filling the gap

Transarc's Encina — which Toleshuck said his division will probably purchase — fills that gap, he said. However, "if Encina is not available on as many platforms as DCE, that could be a problem for us."

DCE-compliant Encina is slated for general availability in the first quarter.

Transarc's initial $15,000 DCE Developers Kit — for which Transarc is now taking orders — will not include file and directory service components, although Transarc's file services were selected by the OSF for integration into the DCE.

On-line database matches up compatible OSI products

BY ELLIS BOOKER
CW STAFF

MCLEAN, Va. — A company planning to buy "OSI-compliant" products from two different vendors must first find out if they will interoperate.

A paradox? You bet. But because the international Open Systems Interconnect (OSI) standard allows a vendor elbow room in the form of different "implementation" possibilities, the compatibility issue is a real one.

Fortunately, users can, at no charge, tap into a little-known on-line database that lists pairs of OSI products that have been tested and found to work together.

Originally created in 1984 under the auspices of the National Institute of Standards and Technology, Osinet was incorporated as a separate entity at the start of 1991.

The end result

The Osinet database is the result of an association of computer and communications systems vendors that have developed test formats for a variety of OSI-based applications.

Hoping to spur more vendors to test and list their wares on the service, Osinet recently waived the $20,000 senior member registration fee to vendors for the first nine months of this year.

A year ago this month, Osinet logged its first entries when IBM and Unisys Corp. delivered results of their successful interoperability tests for their File Transfer, Access and Management (FTAM) products for the IBM RISC System/6000 and the Unisys 2200 series mainframe.

Today, Osinet contains 13 company registrants with 34 individual products and a total of 56 tested "pairs" of entries.

"That makes a total of 112 entries," said Nancy Pierce, Osinet program manager at the Corporation for Open Systems, which administers the system.

According to David Moyer, currently on loan from Unisys as Osinet's marketing chairman, the OSI test formats are rigorous.

"We've come up with over 100 tests for each FTAM and X.400 product," Moyer said, adding that there are on average more than 100 tests in each direction, resulting in more than 200 tests for each pair of products listed in the database.

Major effort

Moyer said the next major effort is to come up with OSI Network Management test formats. He added that the organization will be publishing its X.500 test cases next month.

Users, however, have never been charged for logging onto the donated Digital Equipment Corp. Microvax and examining the Oracle Corp. database that contains the Osinet test results.

Unfortunately, Osinet has no statistics on the number of users who have actually used their resource.

"Right now, there's no mechanism to capture that information," Pierce said. But this feature, as well as a far more user-friendly interface into the database, is being developed, she said.

J. Patrick Gary, head of the advanced dataflow technology office at the Goddard Space Center in Greenville, Md., said he was delighted to hear the database had expanded. He had attended some Osinet workshops a year ago but had not kept up on the progress of the service.

"It's a significant number of pairings," Gary said. "Users will begin to invest if they know products will interoperate."

NEW PRODUCTS

Network management

Localpeek 1.1 has been announced by The AG Group, Inc.

Localpeek debugs Apple Computer, Inc. Localtalk networks. It provides new network utilization and packet error statistics and includes a Packet Selection feature that sifts out unnecessary packets during or after packet capture. An Echo Mode function has been added for analyzing the way a network handles increased network loads and duplicate responses.

Localpeek 1.1 costs $495, or $60 for an upgrade from previous versions.

The AG Group
Suite 202
2540 Camino Diablo
Walnut Creek, Calif. 94596
(510) 937-7900

Best Power Technology, Inc. has created software that allows the company's uninterruptible power supplies (UPS) to act as a power monitor for Novell, Inc. Netware local-area networks.

Checkups collects data from the UPS unit and displays it in graphical form, indicating I/O voltage, battery voltage, temperature and other information. It keeps a record of power anomalies.

Checkups runs on the network server and costs $299.

Best Power Technology
Route 80
Necedah, Wis. 54646
(608) 565-7200

Systems Network Architecture

Harris Adacom Corp. has announced a Government Open Systems Interconnect Profile-compliant IBM 3174-compatible controller.

The Challenger ES/174 Extended System controller offers local, remote and X.25 connectivity for up to 128 coaxial devices and up to 34 ASCII devices and/or hosts. It includes a group polling feature.

Pricing starts at $3,000.

Harris Adacom
16001 Dallas Pkwy.
Dallas, Texas 75248
(214) 386-2000

Gateways, bridges, routers

Hughes LAN Systems, a subsidiary of Hughes Aircraft Co., has introduced the 2 Gigabyte Enterprise Hub.

The hub integrates two fast packet buses along with three Ethernet, three Token Ring and two Fiber Distributed Data Interface buses on a high-performance backplane. One fast packet bus supports 800M bit/sec. asynchronous frame-relay communication; the other is intended to support future products using synchronous physical layer transport, the company said.

Each hub module includes a processor and a Simple Network Management Protocol agent.

Pricing starts at $4,495. Average price per port for a configured system is between $200 and $300, the company said.

Hughes LAN Systems
1225 Charleston Road
Mountain View, Calif. 94043
(415) 966-7300

Micro-to-host

Rochester Software Connection, Inc. has released Showcase Windowlink, a multitasking connectivity software product for personal computer-to-IBM Application System/400 networked environments.

The product allows users to develop Microsoft Corp. Windows applications on the PC that can access an AS/400 database server. The applications can be developed using Microsoft's Visual Basic, conventional C language code or other tools. Processing is shared by the PC and the AS/400 server.

Pricing for a single-user license starts at $495.

Rochester Software Connection
4909 Highway 52 N.
Rochester, Minn. 55901
(507) 288-5922

Data Interface Systems Corp. has enhanced its DI3270 gateway software.

The product now allows networked users to select a Microsoft Corp. Windows-compatible 3270 emulator such as Wall Data, Inc.'s Rumba and Microcom, Inc.'s Relay Gold to communicate with a host through the DI3270 gateway. Nodes that do not require Windows can continue to use the DI3270 emulator.

The DI3270 software supports from five to 253 concurrent host sessions and is priced from $1,095 to $4,495.

Digital Interface Systems
Suite 415
8701 N. Mopac
Austin, Texas 78759
(512) 346-5641

Host-to-host

Systems Strategies, Inc. and The Boston Software Works, Inc. have announced product integration enabling transparent electronic-mail transfer between IBM's Officevision/400 and Digital Equipment Corp.'s All-In-1 environments.

The companies will integrate The Boston Software Works' Interoffice E-mail product with Systems Strategies' Ezbridge Peer-to-Peer VAX-to-Application System/400 communication software. Users can transfer messages as well as word processing documents and spreadsheet files over IBM's Advanced Program-to-Program Communications/LU6.2 transport.

Ezbridge costs between $10,000 and $35,000, depending on features and hardware configuration. Interoffice costs from $4,500 to $24,000 per office system platform. Both products are available from either firm.

Systems Strategies
225 West 34th St.
New York, N.Y. 10001
(212) 279-8400

Modems

NEC America, Inc.'s Data and Video Communication Systems Division has developed a V.32 bis modem supported by dial-up network management through the company's Intelligent Chassis Management System.

Stand-alone and rack-mount versions are available. The N9635E Plus ($1,199) and I9635E Plus ($1,325) modems support V.42 and V.42 bis error correction and multiple transfer rates. They also can be used to configure and control other Plus modems.

NEC America
110 Rio Robles
San Jose, Calif. 95134
(408) 433-1279

Local-area networking software

Asante Technologies, Inc. has announced Persontoperson, a communications software product.

Persontoperson includes voice mail, real-time network conferencing, an I/O board for locating employees, and a window that lets users leave an electronic note on another user's computer. It also allows users to create messages while not attached to the network; messages are automatically transmitted when the system is reconnected to the network.

A two-user pack costs $149 and a 10-user pack costs $399.

Asante Technologies
404 Tasman Drive
Sunnyvale, Calif. 94089
(408) 752-8388

Wide-area networking software

Retix has introduced Microsoft Mail for Macintosh Gateway to X.400.

The product offers X.400 public and private service access to users of Microsoft Corp.'s electronic-mail software. Messages in otherwise incompatible formats can be exchanged in standard X.400 format, the company said.

Pricing starts at $1,795.

Retix
2401 Colorado Ave.
Santa Monica, Calif. 90404
(310) 828-3400

Customer-premises equipment

Digital Access, Inc. has announced the Virtual Bridge for dial-up video teleconferencing.

The product lets users employ videoconferencing at multiple locations without requiring stand-alone controllers at each post. Bandwidths up to 664K bit/sec. are supported.

Image quality does not degrade, regardless of the number of parties added to a conference, the company said.

Virtual Bridge costs $2,500 per installation.

Digital Access
Suite 200
11501 Sunset Hills Road
Reston, Va. 22090
(703) 471-5010

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Kim Myhre, Senior V.P.
Worldwide Consulting

Client/Server: Direction of the '90s
Aaron Goldberg, Senior V.P.
Desktop Computing Research

The Structure of the IT Industry in the Year 2000
David Moschella, Senior V.P.
Worldwide Research

Systems Integration and Outsourcing
Rebecca Segal, V.P. Sales and Services Research

Workstation Opportunities
Vicki J. Brown, V.P.
Systems Research

The Midrange Market Squeeze
David Vellante, V.P. Systems and Software Research

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MANAGER'S JOURNAL

MANAGEMENT SHORTS

CEO Fites honored for tech success

Donald V. Fites, chairman and chief executive officer of **Caterpillar, Inc.,** is slated to be presented with the Gartner Group, Inc.'s eighth annual Excellence in Technology Award tomorrow during the Gartner Group/Conference Board information management conference in New York. Fites will be recognized for Caterpillar's success in improving customer service, increasing product value, lowering costs and achieving gains in quality. The award is cosponsored by the Conference Board.

The Electronic Data Interchange Association (EDIA) has moved its 1992 annual conference in Nashville from December to Oct. 5-7. Disappointing attendance at last year's December conference in San Diego — the first ever held outside the Washington, D.C., area — was one factor that caused the Alexandria, Va.-based EDIA to change the date. In its announcement, the EDIA cited "undue pressure" on member companies "to retain funds allocated for December conferences."

The linkage among networking, computing and multimedia technologies are the subject of a five-month multiclient management study launched recently by **James Martin Strategy** in Reston, Va. Called "The Global Information Industry in the 1990s," the study will attempt to assess the impact of technology developments on corporate networking and analyze key trends in the enabling communications and information technologies of the 1990s.

International Data Corp. in Framingham, Mass., has completed a report on consulting firms that offer business process redesign services, or re-engineering. The report assesses the market for such services and profiles Nolan, Norton & Co., CSC Index, Inc., Andersen Consulting, The DMR Group and Ernst & Young.

Keeping an eye on the carriers

GE entrusts European net operations to three vendors but insists on stateside control

BY ELISABETH HORWITT
CW STAFF

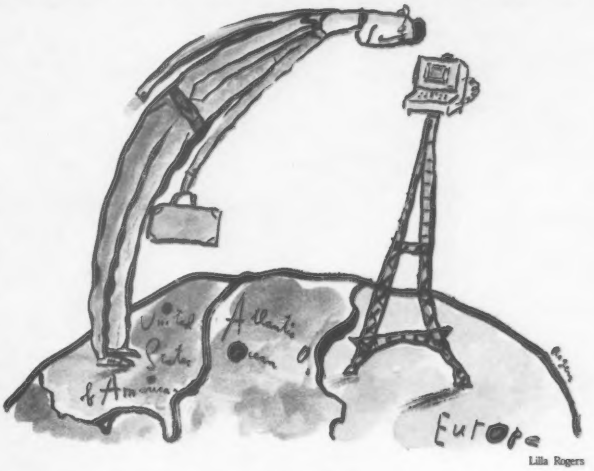
General Electric Co.'s two top telecommunications people have this to say to companies considering outsourcing their entire network operations to a vendor: Think twice.

Not that GE regrets its own decision, announced almost three years ago, to have partners AT&T, France Telecommunications International, Inc. and British Telecommunications PLC install and operate its overseas network switches on the carriers' own premises. The arrangement is saving GE significant amounts of money that would otherwise be spent on setting up and maintaining its own overseas telecommunications operations, according to Stanley Welland, GE's manager of corporate telecommunications.

However, GE's telecommunications executives emphasize that, while the equipment may reside on vendor premises, they insisted right from the start that ultimate responsibility for monitoring and managing the network and providing user support remain with GE's network control center in Princeton, N.J.

"I think it would be very risky" to put responsibility for managing the global network totally in the hands of carriers, Welland says. "No one has the same concern with the operation as you do. You have surrendered alternatives to improve service and lost all your leverage, yet you still retain accountability to users for quality of service. This is not a good position to be in."

"Maintaining control of the boxes, circuits and relationships with [various foreign Postal Telephone and Telegraph authorities] gives us a better feel for the network reliability," says Janet Fields, GE's manager of telecommunications operations. "And users have one place to call when something goes wrong." The network control center provides a 24-hour, seven-day-a-week hot line for users.



Lilla Rogers

While hailed as a pioneer on the global networking front, GE's overseas arrangement is actually very similar to its domestic network, in which AT&T operates the network switches at its own sites and sends network alerts electronically to GE's trouble-ticketing system on IBM's Netview, Welland says.

GE decided to let the carrier trio maintain its overseas network of Timeplex, Inc. multiplexers primarily because it did not like the alternative, Welland says. "That would be for us to go into Europe and try to find a GE business willing to house the necessary gear and do the networking for us." It would also mean assigning GE telecommunications people to maintain the network, Welland says. "If you add all the costs, we might not have been able to afford a global network."

GE's strategy of outsourcing remote operations is becoming increasingly popular among companies expanding their overseas businesses, according to Jeremy Frank, vice presi-

Continued on page 66

Honored training program victim of cutbacks

BY CLINTON WILDER
CW STAFF

It's hard to sustain a job training program when there aren't any jobs.

In a sign of the recessionary times, an award-winning program to train minorities at General Mills, Inc. in computer and management skills has been discontinued. The reasoning was painfully simple: With its profits slipping, General Mills was shrinking the size of its work force in several departments, so the job postings for the program's trained interns were drying up to nothing.

While it existed, the General Mills Mentoring Program trained 20 people and placed about 18 of those in clerical and administrative jobs within Minneapolis-based General Mills. Program founder Mary K. Crozier, manager of training and development in General Mills' information systems department, was honored with both the company's chairman's award and the 1989 Developing the Human Side of Technology Award from Ouellette & Associates Consulting in Bedford, N.H. [CW, Aug. 14, 1989].

General Mills' experience symbolizes a catch-22 for many U.S. companies trying to teach potential employees necessary job skills — and fill in gaps left by the problem-plagued public education system. It is difficult to justify investment in training when the company is cutting back resources, trying to trim staff and often transferring employees to jobs that would have gone to new hires.

Crozier *saw her program cut*

"Companies really have to be proactive in dealing with the lack of skill levels out there," Crozier said, "but it's hard to do if you're in a downsizing mode. We certainly aren't in the business of training them and then having them leave." General Mills managers also did not want to spend time mentoring trainees if they had no chance of being hired at the end of the three-month training period, she noted.

In addition to basic personal computer skills such as DOS, word processing and database management, the program taught "soft" skills, such as on-the-job conflict resolution and time management.

For now, Crozier does not foresee the kind of business pickup that might justify restarting the program. But she encourages similar programs at firms that are in a hiring mode.

"For any program that you start, the timing has to be right within the organization," she said. "I really feel it's something that companies should consider doing, whether we are in a position to do it or not."

SOMEtimes, the best

thing to do is *wing* it.

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Utilities unite to attack high system costs

Canadian gas firms divvy up the $27 million cost of a key system each could not afford alone

BY MEL MANDELL
SPECIAL TO CW

If you cannot afford to pay many millions for critical strategic applications, you might consider what three Canadian gas utilities are doing to share the development costs of a customer information system (CIS).

Gas providers serving about 600,000 customers each in British Columbia, Alberta and Ontario are sharing a $27 million systems integration contract with IBM to design a CIS.

The origin of this arrangement came in late 1989, when Thomas Young, vice president of MIS at BC Gas, Inc., which serves British Columbia, was looking for a partner to share the cost of a CIS.

So was Ted Barnacle of CU Services, the separate information systems operation for CU Gas & Electric in the neighboring province of Alberta. Fortuitously, both executives had struck up an acquaintance while serving on the national board of the Canadian Information Processing Society.

Shared pressures

When Barnacle called Young to congratulate him on being promoted to BC Gas' top IS executive in January 1990, the conversation turned to the pressures on both organizations for a new CIS.

Young's problem was immediate: BC Gas had been cobbled together less than two years before from Inland Gas, a publicly held company, and the gas-supplying division of BC Hydro, a utility owned by the province. Young's then-ancient and inadequate CIS was still provided by BC Hydro — and Young wanted out.

Barnacle had been instructed by senior management to replace CU Gas' 20-year-old, inflexible CIS. He had already begun exploring the notion of sharing the cost of a 21st-century CIS with several other utilities, including one across the border in the U.S. Once these discussions became known, others wanted in.

However, when Kees Vreugdenhil, director of information resources at Union Gas Ltd. in Chatham, Ontario, contacted Barnacle, he was informed that the necessary third partner — the U.S. utility — had already been selected. But that partner later backed out, so Barnacle invited Union Gas to join. Vreugdenhil jumped at the chance: His circa-1970 CIS required too much maintenance and could not be expanded.

In developing the joint effort, "commonality was critical," Young said. "The core system had to cover most of our requirements. And, of course, our platforms had to be the same. We had already decided that only gas utilities would participate, even though the CIS could be adapted to other utilities."

The next big step was convincing senior management of the validity of jointly developing a multimillion-dollar system, something that had never before been tried in the gas industry. Vreugdenhil was pleased that the "internal selling took less effort than anticipated." Finally, approval had to be obtained from each of three provincial regulatory commissions.

Rich Frishman

BC Gas' Young *found partners to share the cost of a new customer information system*

Next came the crucial process of defining the core system, which took months of face-to-face and telephone conversations. A multivolume request for proposal resulted, but the qualified systems integrator vendor list quickly shrunk down to the two giants: Andersen Consulting and IBM.

Young, a former IBM employee, was already happy with Andersen, which was creating BC Gas' Work Management System, a $6 million client/server system to give managers better information [CW, Dec. 9, 1991]. Nevertheless, IBM won with an attractive price of $27 million.

Vreugdenhil said his staff had estimated the cost of replacing Union Gas' CIS at $40 million. "There was no way we could afford $27 million, much less $40 million, on our own," he said.

The joint project has been named Theseus, after the mythic Greek hero who slew the Minotaur monster.

IBM has subcontracted $12 million of the programming back to the IS departments at Union Gas and CU Services and to Sierra Systems, a Vancouver, B.C.-based consultancy.

The customizing phase is expected to cost the three participants an additional $5 million each before the CIS goes on-line midyear. The customizing is needed to link the CIS to the other systems, train hundreds of users and adapt common screens to logos and other formats unique to each participant. Each CIS will be supported by an IBM or Amdahl Corp. mainframe acting as a superserver to the 80386- or I486-based personal computers linked to it as workstations.

If dissatisfied, the participants could opt out of Theseus at either of two phase-completion dates. The first, March 1991, has passed already, and Roland Stevenson, CU Gas' vice president for IS and strategic planning, said he is sure none of the three will opt out at the next deadline, March 30, 1992. The alternative is going it alone, which means settling for a much less sophisticated system.

Savings unclear

Savings from the CIS now evolving through Theseus are hard to project because it will not go on-line until later this year. Vreugdenhil projected a modest return on investment of five years, while Stevenson emphasized the high cost of maintaining his present inadequate CIS.

In taking on the Theseus contract at what appears to be a loss, IBM gained one advantage: It is expected to create a CIS product that can be sold to other utilities, especially those that supply gas.

There is a precedent for such by-products. Andersen created a product called Work/1, which sells for $375,000, out of BC Gas' WMS. BC Gas receives unspecified royalties from sales of Work/1; similarly, the three gas utilities would get some return from sales of any IBM product spun out of Theseus.

Mandell is a free-lance technical writer based in New York.

Keeping a close eye on European carriers

CONTINUED FROM PAGE 63

dent of European telecommunications at research firm Gartner Group, Inc. in Stamford, Conn. "When companies go global, outsourcing makes sense," partly because it is both difficult and expensive "to replicate the knowledge base they have in the U.S."

GE's strategy of keeping a firm finger on its network's pulse is also being followed by savvy companies, Frank says. "It's insane to outsource without retaining the strategic part of your system," as well as continued visibility into its workings, he added. "Otherwise, if you want to change vendors you're stuck, because they have your strategic applications." Firms that entrust their global communications to value-added network providers are insisting on getting an ongoing view of their own portion of the network, Frank says.

GE has an even more direct view into its global network. The company's U.S. network control center is the direct, first-line recipient of all line, card and switch alerts, which are collected by Timeplex's Timeview 2000 management system overseas. "Then we report it to the carrier," Welland says.

"When we set things up, we made sure we do the internal testing" because, while carriers will quickly spot an outright outage, they may not catch incipient problems such as line degradation, Fields says.

"There was some initial user concern as to whether we can manage this network from Princeton without physically having people in Europe," she adds. "I think the answer so far has been yes."

Network reliability has continued to be satisfactory, and level of service, "both out of our organization and on the circuits, has been outstanding," Welland says.

The biggest snafu happened more than a year ago when the TAT8 trans-Atlantic cable that carried a large percentage of GE's overseas traffic failed. GE and its carriers discovered the failure at approximately the same time and responded as a partnership — "which allowed us to bring service up a lot faster," Welland says.

The company was able to reroute transmissions in many cases to backup lines on another trans-Atlantic cable, although some circuits were out for eight hours, according to Fields.

On the support side, "We got a flood of calls, operators were backed up," and some calls had to go to voice mail, Welland says.

GE's Welland: *It's risky to displace network responsibility*

The control center employs 13 people, with six or seven people on shift during busy periods.

The next phase of GE's overseas networking strategy, now getting under way, has the telecommunications division taking more direct responsibility for implementing and managing circuits that go between different European countries, Welland says. Right now, the department is primarily responsible for links between the U.S. and Europe.

An initial aim of the new phase is to consolidate various cross-border circuits into a single Pan-European backbone, Fields says. Another goal is to offset the carrier finger pointing that sometimes crops up when a problem surfaces on a cross-border circuit. While GE's three partners now iron out such issues smoothly, Postal Telephone and Telegraph authorities newly brought into the arrangement sometimes raise challenges, Welland says.

Indeed, GE's ability to get three rival global carriers to work in triple harness is the most ground-breaking aspect of the company's strategy, Frank says.

Life in the slow lane

Despite widespread automation, most U.S. companies do a poor job of using information technology to speed up product rollouts

Peter Yates

Ford's Willis *slashed production time with WERS, a system that lets manufacturing workers access a single parts database*

BY JULIA KING

Companies in the U.S. have freely applied information technology to many business processes — often with great success. But when it comes to using technology to get products out the door faster, experts say the record is pretty poor.

Despite years of effort, information systems teams still play a minor role in speeding product rollouts. Today, computers are used mostly to automate design, manufacturing or distribution. Experts say this slow, fragmented approach must change, however, if the U.S. is to remain competitive in the global economy.

"Information technology often has been applied in a way that ties technology to the old way of doing things," says Ranganath Nayak, a senior vice president at Arthur D. Little, Inc. in Cambridge, Mass. "Some companies have spent a lot of money applying IS in areas like CAD/CAM. But the application of IS to the creation of integrated databases that could speed up access to information has largely been neglected."

King is a free-lance technology writer based in Ridley Park, Pa.

Too bad, because recent years show that time to market plays a major role in making or breaking companies and even entire industries. Before the Japanese started manufacturing plain-paper copiers in the mid-1970s, for example, Xerox Corp. controlled 95% of the worldwide market. By 1983, Xerox's share had nose-dived to 50% — in no small part because Japanese product development cycles were less than half of Xerox's.

"It seems clear that the electronic and high-tech firms in Japan have the ability to rapidly put together new products," says Jay Michaud, an associate director at CSC Index, Inc., based in Cambridge, Mass.

As an illustration, Michaud notes that Toshiba America Information Systems, Inc. has introduced nearly 50 models of laptop computers over the last few years.

This "ready, fire, aim" approach to marketing is possible, he says, because effective technology use lets the Japanese continually experiment in markets and adjust accordingly. In contrast, Michaud says, U.S. companies "tend to build a product and then try to sell it."

Another example: U.S. automakers continue to suffer in part because they still take nearly five years to design a new vehicle, while the Japanese take only three years. Ironically, Nayak says, Japanese manufacturers deploy even less technology aimed at reducing product rollout time than do U.S. firms. But unlike many of their U.S. competitors, Japanese companies shun isolated automation tools in favor of integrated systems, thus deriving far greater benefit with less spending, Nayak explains.

Lessons not learned

Despite such harsh lessons, U.S. companies don't seem to be learning. A recent survey by CSC Index found that only about 20% of large U.S. companies will make big technology investments in research and development and engineering this year.

Similarly, an Arthur D. Little survey of 10 of the largest U.S. manufacturing firms in aerospace, electronics and automotives found that most were still manually feeding changes on computer-aided design and manufacturing databases into production databases — an outdated, error-prone process that greatly slows product rollouts.

Experts say the problem isn't a lack of technology: Integrated databases and automated project tracking systems that can speed rollouts are available. Rather, they say the big obstacle is that many U.S. companies aren't set up to use such tools.

Continued on page 71

Fast Track Development

KEY POINTS

▶Most technological spending goes to piecemeal design and manufacturing automation.

▶Experts say U.S. firms must learn to take a Japanese-like team approach to product development.

▶Concurrent engineering is slowly gaining steam as a way to shorten product rollout times. See story page 72.

▶Downsizing corporate mainframes is the latest step in Harley-Davidson's campaign to slash production times with information technology. See story page 71.

▶More than 200 CAD/CAM stations help Ingersoll streamline the manufacturing of its custom metal cutting and machining products. See story page 72.

▶Lessons learned on the successful 1988 rollout of the Fling 35mm camera let Kodak cut product delivery times up to 40%. See story page 72.

QUOTABLE:

"The earlier in the process IS gets involved, the better the result."

Gordon Willis
Ford

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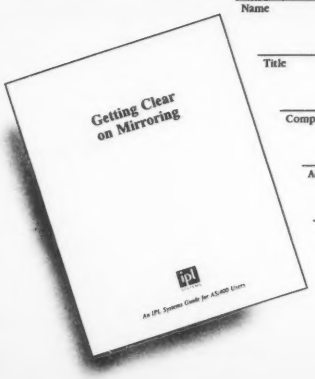

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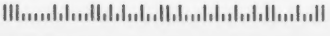

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U.S. companies do poor job of using information technology

CONTINUED FROM PAGE 67

Slow product rollout is "not a technical problem," says Bob Curtice, vice president of information management at Arthur D. Little. Speeding up, he says, "requires major changes in organizational and cultural behavior."

For starters, most U.S. companies have independent design and manufacturing engineering teams. These twin innovative keystones work in sequence; each group has IS automate its own small piece of the product development cycle. One all-too-common result is engineers spending months working on a prototype, only to find that the design is too difficult or expensive to manufacture.

Another obstacle, says Bill Darnton, a partner at Andersen Consulting in New York, is the Western tendency to take the "big bang approach" to new products. Instead of making small incremental improvements the way the Japanese do, companies subscribing to this approach try to leapfrog the competition, he explains.

An example, Darnton says, is General Motors Corp.'s Saturn car. While he says there's no denying that the final result was a good automobile, he notes that the car took seven years to develop. During that time, many Japanese cars added the same features as Saturn — some as early as 1983 or 1984.

For these reasons and others, technology tends to play a superficial role in U.S. manufacturing — even at computer companies. "Information is scattered and in the hands of different people," Nayak concludes. "To put it all together would take a lot of time and effort."

Hopeful signs

Despite the poor track record, IS managers and consultants say not all is grim for IS departments.

Given the chance, IS can play a big role in shortening the design-to-distribution cycle, says Dean Trilling, vice president of information services at American Greetings Corp. in Cleveland. But to do so, IS chiefs must be willing to take direction from the outside, he adds.

For example, Trilling says, it was only after IS participated on product teams and learned firsthand how a greeting card moves through the design, review, mock-up and printing stages that it could implement a computer-based graphics systems and integrated design database. The project has reduced time to market by 30% to 70%, he says.

Gordon Willis, director of product and manufacturing systems at Ford Motor Co. in Dearborn, Mich., agrees that IS can play a key role in supporting efforts to speed up product rollouts. In a recent case, Ford management wanted on-line access for some 12,000 engineers and manufacturing personnel to a single database of parts information. Ford's IS group responded with a computer system known as the Worldwide Engineering Release System (WERS).

WERS lets manufacturing workers access up-to-the-minute parts specifications, which allows them to adjust their tools and techniques to changes made by design engineers. According to Willis, the system has helped cut the product cycle by weeks.

"We used to look at the releasing system as something to be used only at production time when a design was finished," Willis says. "But we have found that the earlier in the process IS gets involved, the better the result."

However, companies such as Ford that use IS to address time-to-market issues are rare, analysts say. One reason is that fewer than 20% of manufacturing companies have completed the needed reorganization. "There is some evidence that this is changing but not in any great numbers," Darnton says. That helps explain why many IS organizations continue to warm the bench as their companies get clobbered.

However, Darnton adds, about 50% of the largest U.S. manufacturers have begun to institute some organizational changes, "perhaps to a single product line," which Darnton interprets as a sign that companies are serious about bringing products to market more quickly.

At Chrysler Corp., for example, the automaker used a team design approach to build its new Dodge Viper model, according to a company spokesperson. The car took less than three years to go from drawing board to showroom, prompting the No. 3 automaker to try the approach on several other new models.

Working together

Another hopeful sign is that more organizations are starting to take the advice of organizational gurus by adopting concurrent engineering (see story page 72).

Consultants say IS can play an important role in bridging gaps between the various groups involved by furnishing integrated systems that would permit concurrent information exchange throughout the process.

Looking ahead, analysts optimistically predict that U.S. manufacturers will quickly get better at deploying technology to further speed product development time in the same way many used IS for better inventory management and order processing.

A recent survey of chief executive officers conducted by *Electronic Business* found that a majority of those polled named shorter product development time, along with closer customer contact, as the keys to halting the U.S. technological decline.

Similarly, a survey of 1,300 engineers conducted last year by *Electronic Design* found that most are counting on new computer-aided software engineering tools to cut design time and time to market. •

Harley-Davidson revs up IS teamwork

BY JULIA KING

It doesn't take rocket science to build better motorcycles more quickly, Richard Kolbe says — it just takes the right tools and teamwork.

The trick, according to Kolbe, information systems director at Harley-Davidson, Inc., is giving engineers information technology tools that reduce the time it takes to develop and manufacture bikes.

The Milwaukee manufacturer recently implemented what Kolbe describes as "a simple combination of database query tools and upload and download functions" to give parts engineers access to the company's warranty database.

The idea is to provide engineers with data that can serve as a yardstick for measuring the performance of their designs.

Harley-Davidson *gave its engineers access to the firm's warranty database in an attempt to reduce 'unfocused' time*

Greater speed is another goal.

"By giving this data to engineers, we're hoping they will be able to better understand if a problem began with a certain design change or why a problem may have occurred with a certain part," Kolbe explains.

In the past, engineers had to do a great deal of testing or risk missing a problem completely, he says. Opening the database is an attempt to reduce that "unfocused" time, he adds.

It's too early to tell if the experiment is a success, according to Kolbe. Engineers will begin to incorporate performance data on 1992 parts into their 1993 designs.

In another move aimed specifically at reducing product development time, IS also established videoconferencing facilities between three sites, linking design and manufacturing engineering teams.

Now, rather than design engineers sending completed paper drawings to manufacturing engineers in a sequential process, the two groups concurrently work out what they plan to make and how they plan to do it during videoconferences held three to eight times a week.

Exploiting information technology to improve production techniques is not entirely new to the company.

In the early 1980s, after competition from low-priced Japanese imports ravaged its market share, Harley-Davidson responded by instituting a new system for just-in-time inventory management.

Kolbe *credits success to the right mix of IS tools*

By 1990, market share rose from 23% to 51%, and productivity leaped 48%, the company says. Most impressive was an increase in inventory turns — representing the number of times production parts were replenished — from five to 20 annually.

Bolstered by these successes, Kolbe says, senior management again turned to IS for more ways to boost productivity and cut costs. His organization responded with a plan to downsize from two mainframe computers to a network of IBM Application System/400 machines at two facilities in Milwaukee and a third assembly plant located in York, Pa.

"The primary driver behind the downsizing was integrating the [previously stand-alone] warranty database," Kolbe explains. "The goal of IS was to put more ownership of data and tools into the hands of end users, so we copied the database to the AS/400s, and once the information was available, a wellspring of ideas came from the engineers."

Engineers came up with the idea of tracking troubleshooting queries from repair technicians at Harley-Davidson dealerships around the country.

"Prior to the database, there was less analysis of warranty and overall operations information," Kolbe adds. "We tended to react only when a dealer fired off a letter. For the most part, this data was ignored, primarily because there was no meaningful way to access it." Now, the information is accessible and available for analysis.

Thanks to a company-wide team attitude, Kolbe says divisional turf battles between IS and engineering over data ownership have been virtually nonexistent.

Then again, he adds, "Perhaps it's because we almost fell off the edge of the cliff 10 years ago that there was enough scar tissue to prevent these kinds of fights." •

CLOSE-UP

Company: Harley-Davidson, Inc.

Goal: Build high-quality motorcycle parts more quickly.

Strategy: Downsize from mainframes to IBM AS/400s; provide warranty database access to engineers.

Expected payoff: Increased productivity and reduced costs.

Ingersoll delivers it your way — and fast

BY JULIA KING

Special orders are the rule at Ingersoll Milling Machine Co. Even so, customers still want fast delivery of the massive, made-to-order products.

Each year, the Rockford, Ill., manufacturer produces fewer than 100 large-scale, customized metal cutting and machining systems for industrial customers. Because no two orders are identical, devising a standard measure of product development time is impossible. Depending on individual product specifications, it can take up to a year and a half to build a single machine.

That hasn't stopped the $550 million manufacturer from exploiting information technology to help streamline the way it designs, manufactures and delivers its machines.

"Information systems involvement in the product development cycle is to provide tools so that engineering, manufacturing and marketing can all do the best job possible," says George Hess, vice president of systems and planning.

Far and away the most powerful tool IS has turned out so far is a customized, integrated corporate database system. It replaces some 1,300 different programs and systems operating from 225 different sets of computer master files, which were "full of redundant and uncoordinated data," according to Hess.

Developed in the early 1980s and continually enhanced since, the system has reduced work-in-process inventory by 48%, according to the company. Moreover, purchasing costs have been reduced by 43% and quality control costs by 34%. Hess says the systems played a big role in the company's winning a prestigious award in 1982 for computer integrated manufacturing from the Society of Manufacturing Engineers.

Ingersoll has also installed an integrated computer-aided design and manufacturing (CAD/CAM) system comprised of more than 200 graphic displays from Cadam, Inc. that are tied into the corporate mainframe, a Hitachi Data Systems Corp. AS/XL 80. The system generates geometric design models employed throughout design, manufacturing, assembly and quality assurance.

Hess says the next step for IS is to set up expert systems. This will involve recording and incorporating judgments made by human experts into applications such as process planning, tool path planning, scheduling and dispatching.

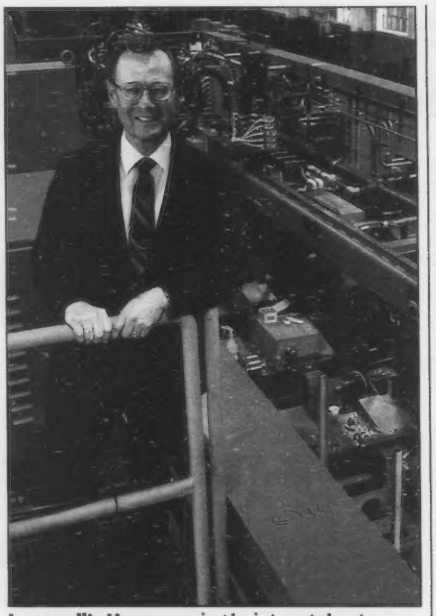
Simplicity has been the guiding principle behind both the CAD/CAM and the integrated database systems, Hess says.

Later this year, Ingersoll will begin building and shipping its first standard product: a $1.5 million milling machine tool.

Throughout development on this system, Hess says, it will be critical for the IS department to listen closely to engineers and other users to continue furnishing them with useful information technology.

"Users are the dominant players in telling us what is to be done. They know their part of the business far better than IS," Hess says.

"So many failures early in the game result from IS telling users what IS thinks they should have," he adds. "Too many systems people come across as cocky or arrogant, and this is sure to doom your system before you get started." •



Ingersoll's Hess *says simple, integrated systems ensure speedy product rollouts*

CLOSE-UP

Company: Ingersoll Milling Machine Co.

Goal: Timely delivery of metal cutting and machining systems.

Strategy: Build customized, integrated corporate database to reduce work-in-process inventory.

Payoff: Work in process reduced by 48%; purchasing costs down 43%; quality control costs cut 34%.

BACKGROUNDER

Continuous process engineering explained

Imagine a restaurant that waits until all the appetizers are made before preparing the salads, then waits until the salads are done before starting on the entrees. Such a place wouldn't stay in business long, right?

Unfortunately, experts say, many U.S. companies take the same approach in designing and manufacturing their products: Start a step, finish a step, move on to the next step. Obviously, this kind of serial approach is rarely the fastest way to get goods out the door.

That helps explain the current interest in "concurrent engineering," a buzzword that's hot in design circles and, slowly but increasingly, in information systems.

Simply put, concurrent engineering overlaps analysis, design and product stages to shorten time to market. This is accomplished by having several functions — including design, development, marketing, manufacturing, service and sales — work simultaneously as a team.

Proponents say the approach can yield better designed, lower cost, higher quality products more quickly, while eliminating the "ping-ponging" that occurs when projects bounce back and forth between groups.

Properly implemented, backers say, concurrent engineering acts as an umbrella concept, encompassing design for manufacture, continuous process improvement, total quality management and quality function deployment.

Popularized in the mid-1980s, the concept predates the more recent notion of reengineering or business process redesign. However, there are definite parallels between the two, says James Moore, president of Geopartners Research, Inc., a Cambridge, Mass., consultancy. Both involve bringing together multiple functions early in the process, he notes.

In recent years, a major driving force behind the concept has been the federal government's Defense Advanced Research Projects Agency. A 4-year-old agency initiative to encourage concurrent engineering in the U.S. military and industrial base is conducted by a consortium of 12 industries, software companies and universities.

The approach is gaining popularity in Europe. In the U.S., acceptance has been slower, although electronics and computer companies are showing interest.

Raytheon, Inc.'s Government Group in Lexington, Mass., began using concurrent engineering in the mid-1980s on its Patriot missile system.

Interest is spreading to other industries. Last July, the Rover Group PLC purchased $34 million worth of new computer-aided design and manufacturing systems from Computervision Corp. to help set up concurrent engineering at the automaker.

Experts warn that the transition to concurrent engineering can take between two and four years, even with pilot projects. Even trickier may be the overhaul of companies that is often required. •

JOSEPH MAGLITTA

Kodak flings itself into key speed-up role

In January 1988 — exactly 38 weeks after the start of design work — Eastman Kodak Co. in Rochester, N.Y., introduced Fling, the world's first disposable 35mm camera. It was the first Kodak product ever to be completely engineered using three-dimensional computer-aided design (CAD) technology and a single database of development information.

Today, Kodak is building on those early lessons in fast product rollouts and applying CAD tools and concurrent engineering principles across all product design areas. The reason, says Woody Noxon, director of Kodak's Systems Engineering Division, is that "information technology enables significant reductions in product delivery times" — reductions of more than 40% in some cases.

Because the initial Fling project proved that technology plays a vital role in greatly reducing product delivery times, it seemed logical that Kodak's information systems organization should also have a role in that cycle, Noxon explains.

To this end, he says, Kodak's engineering and IS departments now work as a team to create "linkages" between design and manufacturing software, as well as with all data associated with the product development cycle.

"We know there are linkages, and now we are working on exploiting them in a bigger scheme on other products," Noxon says. For example, IS is currently teaming with engineering on an integrated system that will directly link product development data generated by design engineers with bill of materials information used in manufacturing.

New tracking system

In another project, the two groups are collaborating with Electronic Data Systems Corp. to create a software product called Info Manager that will electronically track and manage all technical data accumulated over a product's life cycle.

Four years ago, Noxon says, Kodak intentionally focused its first concurrent engineering efforts on a simple product — the Fling — so that engineers could learn about integrated databases and how to electronically manage product design data. Since then, he says, engineers have been able to use this same data to design several more new products, including panoramic, underwater and flash versions of the original Fling.

At the time, Kodak's IS department, like those departments at most corporations, "worked on financial and business operations and had very little to do with managing data in the innovation process," he says.

Today, by contrast, one of the key roles of IS is "to focus on the product life cycle" by working to "synchronize the flow of information, which works to reduce cycle time," Noxon says.

JULIA KING

Data patterns say the darnedest things about your business

Pattern processing starts by building a data warehouse

Coco Masuda

BY WILLIAM H. INMON AND SUSAN OSTERFELT

Most businesspeople will tell you that it's not only the information you get but also how you analyze and interpret it that makes a difference. That's why pattern processing — using technology to identify and analyze patterns in operational data — is becoming an important part of some business strategies.

For Bethlehem Steel Corp. in Bethlehem, Pa., pattern processing was the key to steel quality. Upon completion of a month's steel production, the company's systems were chock-full of information related to the production of a batch, or "heat," of steel. Content, temperature, sequence, speed, production location, gauge and width were some of the thousands of variables tracked. The only problem was that this information was scattered and in conflicting formats, so it was difficult to analyze.

The company created an information warehouse from which it could extract and maintain integrated operational data that Bethlehem's engineers and managers said they needed. By analyzing data on which variables affected high- and low-quality heats, engineers were able to discern patterns in production that led to consistently high-quality heats. Engineers were able to figure out what to avoid and what to strengthen in the process so that they could put out a quality product.

While many companies would like to follow Bethlehem's lead and use pattern processing for the good of their organizations, they are not ready to deal with their information in such a strategic manner. Unintegrated, disorganized, inconsistent and nonhistorical data is at the heart of the matter.

A company can move to pattern processing only by gaining control of the existing data it uses to run day-to-day operations. Information systems staffs need to leverage the investment in older systems and carefully construct an easily accessible warehouse of information for business users.

The challenge lies in IS' ability to understand the business and integrate the masses of variously named and variously organized data.

Why so problematic?

The task is not going to be easy. Consider what seems to be a simple informational request from a user in a financial institution: "How have account balances varied on average this year from the past five years?"

IS' reaction to this analytical request is to sift through its current systems. After all, that's where the data is that relates to account processing. Unfortunately, in most cases, the data needed would be scattered throughout a disparate group of applications — savings, loans, checking, trust and the like — that have been processing data for many years.

Not only is the data everywhere, but there is no consistency to it. There are no standards for understanding and treating an account from one application to the next.

For example, each application may have its own account definition and structure. Some applications may have the same data element names, yet each element may mean something different. Or the elements may mean the same thing but be identified by different names. One application may have account data that no other application has. Another application may have the same data element with the same name as that in another application, but the data elements are calculated differently. And on and on.

Trying to satisfy this user's request from the many separately developed and organized operational systems is difficult. Data is simply not integrated across the many applications that have been built over the years. In fact, because their existing systems were built at different points in time, most companies have no consistency in naming conventions, data structures, key structures, data attributes or algorithms.

Continued on page 76

Inmon is a consultant and lecturer on data architectures and information warehouses. He has written 27 books, including co-authoring *Understanding Data Pattern Processing: The Key to Competitive Advantage* (QED Technical Publishing Group, Wellesley, Mass., 1991). Osterfelt is co-author of *Understanding Data Pattern Processing* and has coordinated and built information warehouses for Affiliated Bankshares of Colorado and Storage Technology Corp.

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COMPUTERWORLD

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Jan. 6	Dec. 20	Dec. 27	**Executive Report:** The Information Systems Contribution to Quality			
Jan. 13	Dec. 27	Jan. 3	**Product Spotlight:** Windows Applications			Mails: Jan. 15 Space Close: Dec. 6 Mat'l Close: Dec. 9
Jan. 20	Jan. 3	Jan. 10	**Executive Report:** Customer Service **Industry Closeup:** Automotive Industry			
Jan. 27	Jan. 10	Jan. 17	**Product Spotlight/Buyers' Scorecard:** LAN Management	Communication Networks Jan. 28-30 Washington, D.C. Windows OS/2 Jan. 28-30, San Jose, CA	Harvey Study	
Feb. 3	Jan. 17	Jan. 24	**Executive Report:** Using IS for Fast Track Product Development			
Feb. 10	Jan. 24	Jan. 31	**Product Spotlight:** E-Mail	Networld Feb. 11-13, Boston	Starch Study	Mails: Feb. 12 Space Close: Jan. 3 Mat'l Close: Jan. 6
Feb. 17	Jan. 31	Feb. 7	**Executive Report:** Beyond Sales Force Automation			
Feb. 24	Feb. 7	Feb. 14	**Product Spotlight/Buyers' Scorecard:** Accounting Systems			
Mar. 2	Feb. 14	Feb. 21	**Executive Report:** Information Systems at the Point of Customer Contact			
Mar. 9	Feb. 21	Feb. 28	**Product Spotlight/Buyer's Scorecard:** Client/Server Application Development		Starch Study	Mails: Mar. 11 Space Close: Jan. 31 Mat'l Close: Feb. 3
Mar. 16	Feb. 28	Mar. 6	**Integration Strategies:** Pulling Macs Into the Enterprise Network **Industry Closeup:** Aerospace			
Mar. 23	Mar. 6	Mar. 13	**Product Spotlight/Buyers' Scorecard:** RISC Desktop Machines and Servers	DB Expo Mar. 23-26 San Francisco	Starch Study	
Mar. 30	Mar. 13	Mar. 20	**Executive Report:** Can IS be Held Libel? Liability for the Loss or Misuse of Sensitive Information			
Apr. 6	Mar. 20	Mar. 27	**Product Spotlight/Buyers' Scorecard:** PC Software—Fresh Application Categories and New Twists on Old Ones	Comdex Spring '92 and Windows World Apr. 6-9, Chicago		
Apr. 13	Mar. 27	Apr. 3	**Executive Report:** Doing Business Abroad			Mails: Apr. 15 Space Close: Apr. 3 Mat'l Close: Apr. 6
Apr. 20	Apr. 3	Apr. 10	**Product Spotlight/Buyer's Scorecard:** Printers Best Suited for a LAN Environment			
Apr. 27	Apr. 10	Apr. 17	**Executive Report:** To Be Announced		Starch Study	
May 4	Apr. 17	Apr. 24	**Product Spotlight/Buyer's Scorecard:** Midrange Systems That Run Enterprises			
May 11	Apr. 24	May 1	**Integration Strategies:** Creating an "Open" Company **Industry Closeup:** Personal Care Industry		Starch Study	Mails: May 13 Space Close: Apr. 3 Mat'l Close: Apr. 6
May 18	May 1	May 8	**Product Spotlight/Buyers' Scorecard:** Routers	Interop East May 18-22 Washington, D.C.		
May 25	May 8	May 15	**Executive Report:** To Be Announced			
June 1	May 15	May 22	**Product Spotlight:** What the Well-Equipped Help Desk is Using			
June 8	May 22	May 29	**Product Spotlight/Buyer's Scorecard:** MRP II			Mails: June 10 Space Close: May 1 Mat'l Close: May 4
June 15	May 29	June 5	**Special Edition:** Annual *Premier 100* Magazine (Ad Close: May 1) **Executive Report:** To Be Announced			
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To complicate the problem further, although a business user might need to analyze historical data, most systems today contain data pertaining only to a brief time frame. Often, operational applications cannot carry five to 10 years' worth of data because if they did, they couldn't meet day-to-day performance and availability objectives.

With this state of affairs, a company is lucky to get any data at all, let alone information that points to a pattern.

The blueprint

How can a company move from the chaos of disparate operational applications to pattern processing? By leveraging the enterprise's investment in older systems and creating an information warehouse specifically designed to assist the business manager and analyst.

The first step in pattern processing is to create a blueprint of information the enterprise needs to make strategic business decisions. This information should be organized by broad classifications of pertinent data, such as customer data, product data, order data, service occurrence data and so forth.

This blueprint can be in the form of a data model, or map. The map shows how data elements relate logically, which is the way a decision maker thinks about them. So, for an insurance agency, the high-level data map may have at its center the insurance policy, with all other entities surrounding it (see chart). Arrows can indicate the relationship between entities (a customer owns a policy, an agent may service a policy and so on.)

The data map is further refined by associating a data entity with each high-level element. Data entities attached to the element "agent" would therefore include such things as agent name and identification number.

An insurance company actually built a high-level diagram like the one pictured as the basis for fraud analysis. To keep its health care costs down, the company wanted to make sure it was paying only legitimate claims.

Therefore, its "claim" data element included entities with information on cost per type of claim. It structured its information warehouse to flag exceptionally high costs per type of claim. Staff analyzed the patterns of these costs and researched them before making payments, thereby reducing the amount of fraudulent claims.

The blueprint should reflect the way the company wants to do business and delineate the data elements, relationships and dimensions (such as time span) required to make good company decisions. The data model is a logical representation of the data to be incorporated into the information warehouse; the physical population of that data from existing systems comes later.

The blueprint can be built quickly (in six months or less). To portray an accurate picture of decision-support data requirements within the data model, don't underestimate the involvement of business users. It is imperative that IS conduct interviews with business leaders to determine their decision-support data needs.

Design of information warehouse

Once the data model is built, IS can move on to designing an information warehouse, the physical place where the data will reside. An information warehouse is a central source of data, stocked with data extracted from different operational systems and standardized.

While it can successfully be built with other technologies, an information warehouse lends itself to relational database technology. Unlike older database technologies that require predefined access paths to data, relational database management systems provide the capability of performing "joins" that relate data found in different tables.

This enables "slice and dice" data analysis — for example, analyzing once by product, then by region, then by customer and so on. The logical data model forms the basis for IS to begin the physical relational database design.

Extracting data

With the physical warehouse defined, the process of extracting data with which to populate it begins. An extract program takes data from various operational systems and organizes and enhances that data for decision-support use. With multiple data processing applications having the same or similar data elements (such as customer name) and with potentially different data formats, it's important that IS and the business together determine what operational system has the "best" customer name.

For example, one system may have a 20-character name field while another has a 40-character name field. The business staff may indicate that a particular customer name field in one of the operational systems is never kept up-to-date or is used for a different purpose than it was originally intended.

Together, the business users and IS need to determine the most appropriate source for overlapping data.

High-level data model

For this insurance firm, the next step would be to prepare a detailed model outlining specific data elements needed for each broad category

Source: Susan Osterfelt

CW Chart: Marie Haines

Business users should also specify which data element names are meaningful to them and what format the data element should take. For example, the data element name "sales margin" may have little meaning to a business analyst. In his line of work, the name "profit margin" is more commonly used. Or perhaps calculating profit margin to six decimal places may have no utility (or, conversely, great utility) for him. The quickest way to failure is for IS to assume the users' decision-support data needs are based on naming conventions and algorithms found in older operational systems.

Once the data is defined, the extract program will derive data elements with consistent algorithms. In addition, the extract will simplify data structures, equate different formats, summarize data where appropriate and provide archival or historical data.

Data structures in operational systems support complicated processing and, therefore, tend to be complex. These complex data structures make data difficult to access without knowledge of a third-generation programming language because they are embedded in the program.

For example, with operational systems, if a business user needed to get information on whether a company is tax-exempt, a programmer would have to go into the Cobol program and extract the data from a broad data field referring to tax status. In the extract program, complex data structures can be simplified for use in the information warehouse. Broad data fields can be broken out into distinct data elements — taxable, nontaxable, tax-exempt and so on — that are accessible and meaningful to the business user.

Furthermore, data in operational systems comes in many different formats. For example, some systems use a Gregorian date format; others use the Julian date format. Within the extract, these formats are "equated" into a consistent date format that is easily understandable by the business. The programmer writes the extract in the form the business user says he prefers.

Data in an operational system has to be detailed to support the day-to-day aspects of running the business. However, users who need to forecast and carry out other strategic decision-making typically require data at a more summarized level. In the extract, data can be summarized to the appropriate level for decision-support activities.

In addition, that data can be archival or historical in nature. Historical data can be obtained for the information warehouse in two ways. One way is to take a snapshot of operational system data at a point in time meaningful to the business (such as month's end), retaining that snapshot in the information warehouse.

The other way would be to have an operational "event," such as a change in a financial account's status, trigger the creation of a historical record.

With historical information of this nature, users can analyze how long the status of a financial account has remained the same or how often an account has changed status, creating a pattern out of the status changes. For instance, financial institutions grade loans on the borrower's ability to pay it pack, with Grade 1 typically the highest grade. If a commercial loan has jumped back and forth between grades over a period of time, that may indicate a poor credit risk.

On a larger scale, by being able to capture the history of a bank's entire loan portfolio, the institution can plan its own financial needs better, such as making sure it has the finances to cover bad loans or late payments.

While historical data tends to bog down performance and availability of operation-

Continued on page 78

Colorado bank cuts problem loans 59%

Profitability is an elusive goal for corporations within a depressed industry. Nowhere is that elusiveness more evident than in the financial services marketplace. However, one institution has apparently avoided a nasty future by developing an information warehouse and utilizing pattern processing.

In the late 1980s, Colorado, like most other states, experienced poor economic times. Affiliated Bankshares of Colorado, a 28-bank holding company with assets of $2.9 billion, was not immune and — like its banking brethren — suffered some substantial loan losses. The bank felt that better quality information on bad or marginal loans was a critical component in regaining its profitability.

IS staff members set about creating an information warehouse, which took about 21 months: six months to create the data model, eight months to decide on and build the relational database environment, five months to write extracts from the operational systems and two months to design the first problem loan application.

Affiliated Bankshares populated the information warehouse with all loan data — mortgage, installment and commercial — and enabled managers to access patterns of historical data on problem loans.

The upshot is that the institution has cut its loan portfolio analysis time from 20 days to two days after month-end close. Previously, managers at the 28 banks had to wait until IS got loan data out of operational systems, at which time the managers would enter it onto a spreadsheet. Often, the bank would be 25 days into a new month before managers had data on problem loans.

Today, not only is loan information automatically available, but the system can also automatically calculate the adequacy of each bank's loan loss reserve to cover potential charge-offs.

These capabilities enable loan officers to make better informed decisions regarding individual problem loans and to help them with total loan portfolio management.

According to Gordon Pedersen, Affiliated Bankshares' treasurer and executive vice president of finance, pattern processing has been "instrumental in reducing the overall level of problem loans in the corporation by 59% since 1988."

Others say the bank must be doing something right. It recently caught the eye of Banc One Corp. (with $46.2 billion in assets) in Columbus, Ohio, and has signed a letter of intent to merge.

SUSAN OSTERFELT

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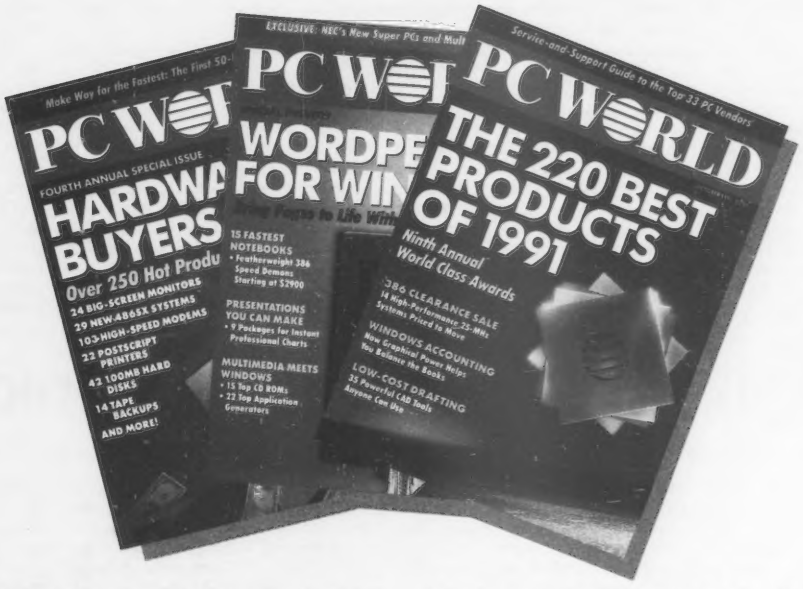

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al systems, the nature of the information warehouse and decision-support environment enables it to get around that problem. First of all, the information warehouse is not accessed constantly, as is an operational system. The lighter load puts less strain on the system.

Also, the number and nature of data elements in the information warehouse are significantly different from the number and nature of data elements needed in an operational system. Specifically, fewer data elements are needed in the warehouse. Keeping a more extensive history of fewer, summarized data elements helps alleviate the performance and availability problems inherent in an operational environment. In these ways, extracts can solve the problems of unintegrated data and the lack of history found in existing operational systems.

Providing access

While data integration and consistency through the extraction process are the primary benefits of an information warehouse, data access is the key to its success. Access to information for the purpose of processing patterns can be provided in two ways.

Because the entire focus of information processing is on the business use of data, business users must be able to easily access and manipulate their data.

One way is through end-user tools that business staff members can use to perform ad hoc, onetime queries against the information warehouse.

Some of these tools have a graphical user interface that mirrors the data model and performs relational joins automatically. With these tools, a business analyst can graphically (not programmatically) select the information needed from the information warehouse via client/server processing, moving it directly into a spreadsheet, for example, to perform further analysis or identify patterns.

Sales managers at an insurance firm, for example, could keep tabs on sales of homeowner policies by region. If they notice that fewer policies are sold in the Northeast compared with the rest of the country, they might decide to lower rates for policy owners in that region. Such a pattern discovery could help a firm manage its policy pricing more competitively.

The second way to provide information access to business professionals is to develop applications (reports or screens) for repetitive information requests. These applications often take the form of executive support systems, executive information systems or decision-support systems and provide push-button access of predefined information requests.

For example, a system can utilize point-and-click technology to show sales by region, by product and by salesperson. Or it can reveal, through numbers or bar graphs, when data exceeds predetermined limits, such as cases in which a budget is exceeded by 10% or more or sales jump 5% or more over forecasts.

These types of applications can be developed by IS staff members; however, personal computer- and Apple Computer, Inc. Macintosh-based tools also exist that make it easy for a businessperson to develop his own applications without having to know a programming language.

The upshot of all this is that business users now have direct access to the data they need to assist them in making strategic decisions.

The ability to do pattern processing is rife with possibilities. The bottom line of the company is enhanced quickly and favorably by executives being able to see the forest, not just the trees. Management can identify trends and patterns not otherwise discernible and make better informed business decisions.

The key to pattern processing lies in leveraging our investment in older systems and building a warehouse of integrated information specially designed for business use. IS holds the key; it can either ignore the need or fulfill it. •

Staff requirements

How many people does it take to implement a pattern processing environment? To a large extent, the answer depends on the people doing the work and their level of expertise. Having one experienced person who has been through the implementation steps and knows the business at hand can be a boon by cutting down on the amount of people needed.

Assuming a staff has a high level of motivation and competence, here's a rule of thumb:

- It takes four to eight people to create the blueprint, or data model.
- It takes two to four people to design the physical information warehouse.
- It takes one to eight people to determine the source of data and write the extract programs (assuming one person for every three to four programs).
- It takes one to four people to provide decision-support access.

The length of time needed to construct a pattern processing environment depends on the size and complexity of the organization. The typical time frame, however, is six months to two years.

Justifying the costs of pattern processing

Here are four arguments to use to get the money needed for an information warehouse

BY W. H. INMON AND SUSAN OSTERFELT

Integrated, shareable decision-support data environments are required to enable pattern processing. Costs for providing an information warehouse environment to support pattern processing can be justified through four methods:

▶**"If even one better (ad hoc) decision is made."** Method 1 says the costs of creating the environment, storing and accessing the data and supporting the environment once it is built can be justified "if even one better decision is made." Quite often, the effects of one better decision can indeed be quantified.

For example, a company is incurring unnecessary mailing costs associated with direct mail campaigns because customers residing at one address have multiple accounts, so multiple sets of marketing materials are being mailed to that address. Integrating customer address data by "household" within the information warehouse associates all customers who reside at one address, ensuring the mailing of only one set of materials per campaign.

Forecasting the number of direct mail campaigns the company is anticipating, along with the number of "multiple" account relationships per household, can easily yield a direct dollar benefit of the integration provided in the warehouse. If the company's reliance on direct mail campaigns is significant, the entire cost of building, storing and maintaining the data warehouse can be not only quantified but also justified with this method.

Similarly, in a manufacturing environment, knowledge of parts failure information can justify a data warehouse environment. Integrated, historical information on parts failure trends could potentially avert a serious machine failure and the resulting loss of business because of customer dissatisfaction. The unfortunate company that has already experienced such a failure and the resulting loss of business could easily apply this theory: "If we could have anticipated the problem, what would it have saved us?"

▶**"What better repetitive management information is available?"** Method 2 justifies the costs based on repetitive, as opposed to ad hoc, data applications provided by the information warehouse. Improved ongoing management information can result from the creation of a pattern processing environment; this may involve better decisions as a result of more timely and consistent access to data. Knowledge of what those iterative decision-support applications are and the potential benefits that can be derived can be factored into the cost justification process.

▶**"How much easier is it to get at data?"** Productivity improvement, or reduced information production cycle time, is the key component of Method 3. This method is often the most difficult to realize. While productivity improvements themselves can be quantified in terms of salary costs expended, it takes discipline for a company to translate those improvements into reduced bottom-line expenses. In other words, it is difficult, though certainly possible, for a company to lay off people as a result of improving productivity. It is easier to say that these people are now free to perform other, more valuable activities for the corporation.

▶**"Can we reduce the cost of quality?"** Method 4 involves justification based on the increased accuracy of data. One way to justify increased accuracy is by reducing the "cost of quality."

The costs of doing business can be separated into two areas: the costs of performing initial basic activities that result in profit for the company and quality costs. Quality costs are those costs involved in ensuring customer satisfaction with, or accuracy of, products or services. A general rule of thumb for business is that the lower the cost of quality, the better.

The costs associated with ongoing, continual validation of information are the costs of quality. The cost of providing an information warehouse environment may also be considered a cost of quality.

The cost of providing a shareable database of integrated corporate information and easy user access tools, however, is much lower than the cost to the corporation of multiple, repeated individual data gathering and data validation activities. A business can substantially lower its cost of quality in information production with an information warehouse, and those costs can be enumerated.

Specific costs

In terms of what needs to be justified for the pattern processing environment itself, the cost of a relational database management system will likely be high on the list.

A nontrivial cost associated with creating such an environment is labor. IS needs to estimate the time required to create and populate the information warehouse. In some cases, with a temporary reassignment of personnel from other functions, there is an opportunity cost of *not* using these people in their original functions that needs to be quantified as well.

Not only the cost of personnel resources for creation of the environment but also the ongoing support costs involving the "care and feeding" of the relational DBMS, the data model, the extracts from the operational systems and so forth must be estimated.

Data storage sufficient to support the data warehouse environment rarely exists as excess capacity. Therefore, the cost of additional data storage needs to be factored in as a cost of doing business for the information warehouse environment. There may be other costs required to support a pattern processing environment (network, back-end processors and so forth) that also need to be factored into the cost-justification effort.

Excerpted from Understanding Data Pattern Processing. *Copyright W. H. Inmon and Susan Osterfelt.*

NATIONAL
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Target practice

▶ Last year, New York-based hardware and software vendor **Source One International Corp.** branched into the personal computer market. Last week, with the hot spots of the computer industry still fixed in its sights, the 9-year-old privately held firm announced a joint venture with the former staff of network systems integration provider **Pentagon Ltd.** The newly minted **Source One/ Pentagon Group** starts life with 5,000 installed local-area networks and an agenda that includes client/server computing, document imaging, management and outsourcing services.

Integrated image

▶ Milpitas, Calif.-based **System Industries, Inc.** last week segued into the burgeoning imaging market via an agreement with **Excalibur Technologies Corp.** System Industries will market Excalibur's Pixtex electronic filing software and its own Laser's Edge jukebox as an integrated package. Available on the Digital Equipment Corp. VAX platform, the new offering targets a document imaging market that is currently moving in on the huge sums — up to 10% of a firm's gross revenue, in some cases — that System Industries calculates U.S.-based companies are spending to manage an estimated 1.3 trillion paper documents in their offices each year.

Continued on page 81

Bush clarifies stance on telecom issues

On President Bush's recent post-Japan and preprimary campaign visit to New Hampshire, he clarified his position concerning several telecommunications/computing issues for the trade press, including Computerworld *Senior Editor Joanie M. Wexler. Pro-competitive activity and deregulation surfaced repeatedly as suggested spurs for developing the U.S. telecommunications infrastructure and opening up foreign markets to U.S. computer businesses.*

Q The foundation of American business and culture is becoming increasingly anchored in the electronics medium. To what extent is it appropriate for the federal government to involve itself in policy-making to protect sensitive online information of companies or individuals and to rule on what constitutes invasion of privacy?

A The government has a role to play both in protecting American firms and individuals from electronic spying and in ensuring that in the computer age, individuals continue to enjoy a right to privacy. At my direction, our intelligence and law enforcement agencies are putting more of their resources into combatting electronic spying by foreign governments and foreign competitors of American firms.

At home, we need to be sure that, unless the circumstances provide a good argument to the contrary, individuals should be told what information is being collected on them, how it is being collected and to whom it is being disclosed ... Government must balance these concerns against the legitimate needs of law enforcement and the need for business efficiency. Obviously ... it wouldn't make sense for the FBI to notify a drug kingpin when preparing to put a tap on his telephone line.

Q Currently, U.S. companies hold a significant lead in the worldwide computer networking business. How can the Bush administration work with foreign governments

Continued on page 80

Gamma Liaison

President Bush *'believes in enforcing trade laws that prohibit unfair trade'*

Profit shift scuttles Compaq/Silicon alliance

BY CAROL HILDEBRAND
CW STAFF

Compaq Computer Corp. and Silicon Graphics, Inc. may have had their technical differences, but that did not split their recently forged alliance. Their partnership foundered on the shoals of Compaq's shifting profits.

Last April, the companies announced an agreement to jointly develop workstations based on Mips Computer Systems, Inc.'s reduced instruction set computing processors. For Silicon Graphics, the machines offered a way to buttress the low end of its line. For Compaq, it promised a boost at the high end.

Two weeks ago, the firms said they would dissolve their deal, although each will retain access to technologies developed while the agreement was in place. The dissolution also extended to Compaq's investment in Silicon Graphics: The latter is set to buy back approximately $150 million in stock now owned by Compaq, which will hand over $3.75 million to Silicon Graphics this month as part of the restructuring deal.

Compaq spokesman Bob Beach said that product strategy differences between the firms played a major role in the sundering of the relationship. However, he acknowledged that Compaq's recent restructuring in the wake of financial woes had an effect.

However, Eckhard Pfeiffer, Compaq's chief executive officer, denied this. "If we would be in same financial position this year [as last], I'd still not be putting money away that I can use more directly," he said.

Dave Bagshaw, vice president of marketing at the Entry Systems Division of Silicon Graphics, took a slightly different view. While the alliance involved more technological compromises than he has run into in similar agreements with other companies, he said, "If Compaq had the same financial position today as a year ago, this never would have happened."

Bagshaw said the stock buyout would not impact Silicon Graphics' bottom line; the company, he said, has some $250 million of cash available.

Both companies also strongly reiterated their loyalty to the Advanced Computing Environment consortium.

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Bush clarifies telecom stance

CONTINUED FROM PAGE 79

such as the Japanese to avoid protectionist backlash actions from U.S. computer network vendors, similar to those that have occurred in the semiconductor business?

A I . . . believe in enforcing trade laws that prohibit unfair trade and that government should foster healthy growth of the U.S. infrastructure through the judicious use of macroeconomic tools, such as spending and tax policies.

I support making research and development tax credits permanent and reducing capital gains taxes.

Q Do you see further deregulation of the local telephone companies as an appropriate means of promoting the innovative network services needed for the U.S. to retain its position as worldwide telecommunications leader?

A I support policies that promote competition between local telephone companies and favor the removal of regulations that unnecessarily restrict the telephone companies' flexibility to meet customer needs.

Now, government sets rigid rules that limit competition among communications companies and reduces investment in the communications infrastructure. Some of the largest telephone companies are prohibited from providing cable television service, while cable companies are prohibited from providing telephone services.

The largest telephone companies cannot manufacture or even perform research and development that would lead to product improvements, and there are many restrictions limiting the activities of companies involved in various parts of the broadcast television and radio business. I support the removal of such restrictions.

Q What role can the U.S. government play to ensure that foreign governments in Europe and Asia abide by software copyright laws?

A America is one of the primary producers of software and other intellectual property. The U.S. government must take the lead in negotiating bilateral and multilateral agreements that afford American firms protection against piracy and other forms of theft of this property.

At my direction, U.S. trade negotiators have insisted that the protection of software copyrights owned by American firms be included in any new [General Agreement on Trade and Tariffs]. I am pleased to report that in the most recent draft of the proposed agreement, software would be protected as literary works: the highest form of copyright protection.

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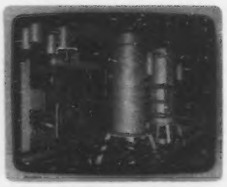

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▶ Communications equipment distributors from 11 European countries have joined forces to serve the needs of multinational network users, according to a recent report in the French business press. The **European Network Association** has formed a European Economic Interest Grouping — a move that gives it legal status at the European Community level and allows it to trade as a Pan-European company.

Sticking with status quo

▶ With continuing upheaval in the former Soviet Union and concern over the stability of nuclear arms controls, the Japanese government will hold to regulations of the Paris-based **Coordinating Committee on Multilateral Export Controls** (COCOM) regarding exports of sensitive technology, according to a recent report in the Japanese business press. The rules will apply to nations in the Commonwealth for Independent States, as well as Czechoslovakia and Poland.

Running to type

▶ Britain's executives have overcome their fear of keyboards, according to a new survey that shows some 80% of them now acknowledge that they do some of their own letters and reports. Recruitment agency **Gordon Yates** polled 500 firms and found that the line once drawn between executives and secretaries is newly blurred by the personal computer. Executives who shun the typewriter as beneath their station are pleased to belly up to the desktop computer, the survey said; it speculated that 7 million Britons now use computers during their workday.

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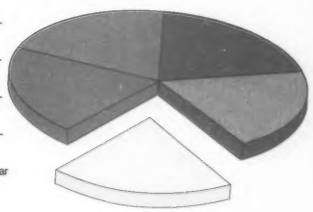

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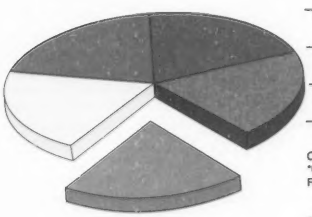

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   21. Dir./Mgr. MIS Services, Information Center
   22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; LAN Mgr., PC Mgr.
   23. Dir./Mgr. Sys. Development, Sys. Architecture
   31. Programming Management, Software Developers
   60. Sys. Integrators/VARs/Consulting Mgt.

   OTHER COMPANY MANAGEMENT
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   12. Vice President, Asst. VP
   13. Treasurer, Controller, Financial Officer
   41. Engineering, Scientific, R&D, Tech. Mgt.
   51. Sales & Mktg. Management

   OTHER PROFESSIONALS
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   80. Educator, Journalists, Librarians, Students
   90. Others _____
   (Please specify)

3. IS INVOLVEMENT (Circle all that apply)
   Please indicate your involvement in IS/MIS/DP.
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Clouds lift a bit for Unisys

BY ELLIS BOOKER
CW STAFF

BLUE BELL, Pa. — In the same measured tones he used two years ago in front of an angry group of shareholders, Unisys Corp. Chairman and Chief Executive Officer James A. Unruh late last month addressed his company's just-announced profitable fourth quarter — the first in two years — and the firm's prospects for 1992.

Our "people feel somewhat vindicated," Unruh said, referring to the assessment of some observers a while back that Unisys, awash in debt, was past saving.

Noting its uptick amid a recession, Unisys' top executive called the quarter a "milestone" and "the first stage in the [firm's] continuing recovery."

"If you look over the last year, they've pretty much been meeting goals," said Anne Baltz, a senior member of the executive staff at the Systems Engineering Division of Computer Sciences Corp. in Falls Church, Va. Baltz is also vice president of the Unisys user group, Use, Inc.

Many other users echoed this cautious optimism.

"I'm certainly encouraged they were able to turn a profit in the quarter," said Steve Ayers, director of quality and information services at Paramount Packaging Corp. in Chalfont, Pa.

However, he added, a single positive quarter after so many negative ones cannot be taken as a sure sign of a turnaround.

For Craig Burlingame, director of information systems for the town of Barnstable in Hyannis, Mass., the profitable quarter, at the very least, helps him face the town's management. "We can say we're dealing with a company that's turning a profit," he quipped.

Analysts, too, said they see Unisys as having turned some kind of corner; a number of them concurred with Unruh's prediction that the company will be in the black in 1992.

Unfirm future

However, the same observers noted that the firm's future is going to be complicated.

"They've changed their image from 'Will they survive?' to 'They will, but how healthy will they be?' " said Sam DeRosa-Farag, an analyst at First Boston Corp. in New York.

For example, the fourth-quarter report showed a better net worth but a larger sales drop — about 16% — than DeRosa-Farag had expected. At the same time, Unisys' cost-cutting is "way ahead" of plan, and its margins have improved, which together should lead the company into a profitable 1992, he predicted.

While Unisys' total 1991 revenue fell from $10.1 billion in 1990 to $8.7 billion, the year was brightened by at least two items: a net-of-cash debt reduction in excess of $850 million — better than Unisys' own target of $600 million — and an inventory level of slightly under $1 billion, its lowest since 1986.

Unruh *vindicated by a profitable fourth quarter*

Meanwhile, the acquisition rumors that have dogged Unisys for months and on which the company has refused to comment are well known to users, Baltz said. "Half of us are expecting at least attempts at a takeover," she said.

Ayers, meanwhile, said there have been so many of these rumors that he is immune to them. Burlingame said he doubts a buyer will emerge with the $5 billion to $6 billion needed to buy the huge computer company.

Unruh, constrained by a company policy against commenting on rumors, nevertheless reacted fiercely to the suggestion that Unisys withdrew a public offering for its Paramax Systems defense subsidiary last year in order to stymie foreign buyers who would have had difficulty acquiring Unisys and its defense unit together.

"There was only one reason Paramax was pulled back, and it was purely an economic consideration," he said. "It was an asset worth more to us than to the marketplace."

In addition, several users echoed Unruh's contention that Unisys has already been forced to confront changes in the market that its competitors are only now facing.

Oracle targets Sun, HP in unit reorganization

BY JEAN S. BOZMAN
CW STAFF

BURLINGAME, Calif. — Oracle Corp. late last month began reorganizing its product divisions along vendor lines.

The move also creates two new business units targeted at Sun Microsystems, Inc. and Hewlett-Packard Co. machines, bringing the firm's total number of divisions to six.

Jerry Baker, senior vice president of Oracle's product line divisions, said the changes reflect the fact that the Oracle user base is moving away from proprietary operating systems and onto Unix platforms. Unix-related sales amounted to more than $500 million last year, Baker said, with Sun- and HP-related sales each contributing some 20% of the sum.

HP sales included proprietary platforms, but they are becoming increasingly Unix-driven, according to Oracle.

Unix-based sales of $182 million for Oracle's first half of fiscal 1992 mark a 30% increase over Unix's bottom-line contribution in the corresponding period in 1991.

At the same time, Geoff Squire, president of Oracle's worldwide distribution organization, denied a suggestion made by several analysts that Oracle's new per-user pricing policy for Unix was reducing overall Unix revenue. The number of Unix units sold, he said, is going nowhere but up; the fact that the revenue dollars are down may be the result of unfavorable currency translation.

Unix the future

Lawrence Ellison, Oracle's chief executive officer, told analysts that Unix was, indeed, the future for Oracle sales of relational databases, computer-aided software engineering tools and application software.

"Open systems are cheap, they're fast, and they're easy to use," Ellison said. "But they've got to be reliable."

Oracle has been criticized in the past for quality-assurance problems, he conceded.

Andersen partner becomes president of AGS Computer

Paul G. Cosgrave, formerly managing partner of integration services and technology for the Americas at **Andersen Consulting**, has left the consulting firm he had served for 19 years to become president of Nynex Corp. software and consulting subsidiary **AGS Computer, Inc.** in White Plains, N.J. In his new role, Cosgrave succeeds **A. T. Engkvist**, who retired at the end of last year.

Succeeding Cosgrave at Andersen is **Donald Monaco**. Monaco is the firm's former managing partner of integration services and technology for the U.S. central region.

Apple Computer, Inc. last week announced the promotion of **David Nagel** to senior vice president of the Advanced Technology Group, as well as his appointment to the company's executive management team. Responsible for directing long-range research and strategic planning for Apple's future technologies, Nagel will now also serve as the team's technical adviser.

Ronald K. Bell is the new vice president and general manager of Blue Bell, Pa.-based **Unisys Corp.**'s Unix Systems Group, which is based in San Jose, Calif. Prior to his current appointment, Bell, a 22-year Unisys veteran, served as director of systems engineering in the Unix group.

Librex Computer Systems, Inc. last week announced that **Kenzo Tada** will be its new president. The San Jose, Calif.-based personal computer products vendor was founded in 1990 as a wholly owned subsidiary of **Nippon Steel Corp.** Tada, a 30-year Nippon Steel veteran, will succeed **Toshiji Tanaka**, who is returning to Japan after the successful Librex launch to assume a senior management position at the parent company.

NATIONAL BRIEFS

Lessor is more

▶ **Unisys Corp.** and Boulder, Colo.-based **Leasetek Corp.** are on their way into a joint venture to offer lease financing services on all Unisys commercial products, the companies announced last week. While **Unisys Leasing Corp. (ULC)**, headed by former Unisys Finance Corp. President James A. Cracco, is new, it's no start-up: The venture inherits the benefit of Leasetek's six-year relationship with Unisys and assumes Unisys Finance Corp.'s domestic lease origination activities.

Meet the new boss:

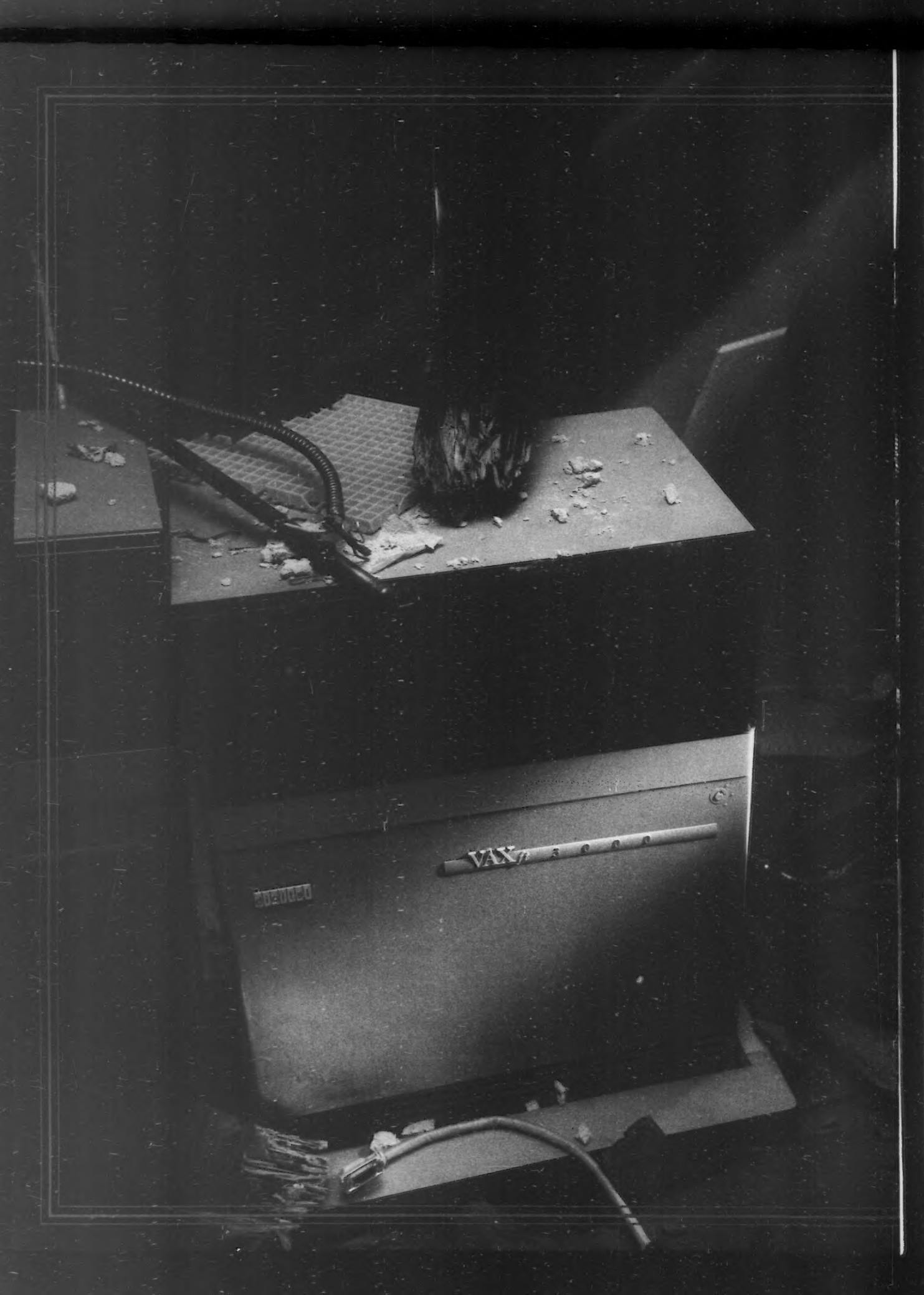
▶ The presidents of **Northern Telecom Ltd.**'s four marketing organizations are about to report to a new executive: 30-year **IBM** veteran **Edward Lucente**, who joined the telecommunications firm in early 1991 as senior vice president of marketing. Last week, the executive, who once headed IBM World Trade Asia Corp., was appointed to Northern Telecom's newly created post of executive vice president.

Fourth-quarter earnings 1991

Company	Revenue Oct. to Dec. 1991	Percent change from 1990	Profit Oct. to Dec. 1991	Percent change from 1990
Amdahl Corp.	$389.9M	(40%)	$(12.7M)	—
Borland International, Inc.	$114.6M	(6.6%)	$7.5M	10%
Comdisco, Inc.	$553M	5%	—	—
Conner Peripherals, Inc.	$417M	(.2%)	$13.2M	(72%)
Cray Computer Corp.	—	—	$14.6M	—
Cray Research, Inc.	$316.5M	24%	$59.6M	79%
Knowledgeware, Inc.	$32.6M	10.1%	$1.3M	(57%)
Network Equipment Technologies, Inc.	$47.1M	33%	$.971M	—
Ross Systems, Inc.	$19.7M	30%	$1.3M	115%
Sequent Computer Systems	$61.5M	(16%)	$1M	—
Silicon Graphics, Inc.	$188M	38%	$14M	37%
Stratus Computer, Inc.	$128M	8%	$17.6M	30%
Tandem Computers, Inc.	$454.5M	2%	$(94.6M)	—
Teradata Corp.	$79.4M	24.4%	$2.6M	508%

*Parentheses indicate a reduction or loss.

CW Chart: Janell Genovese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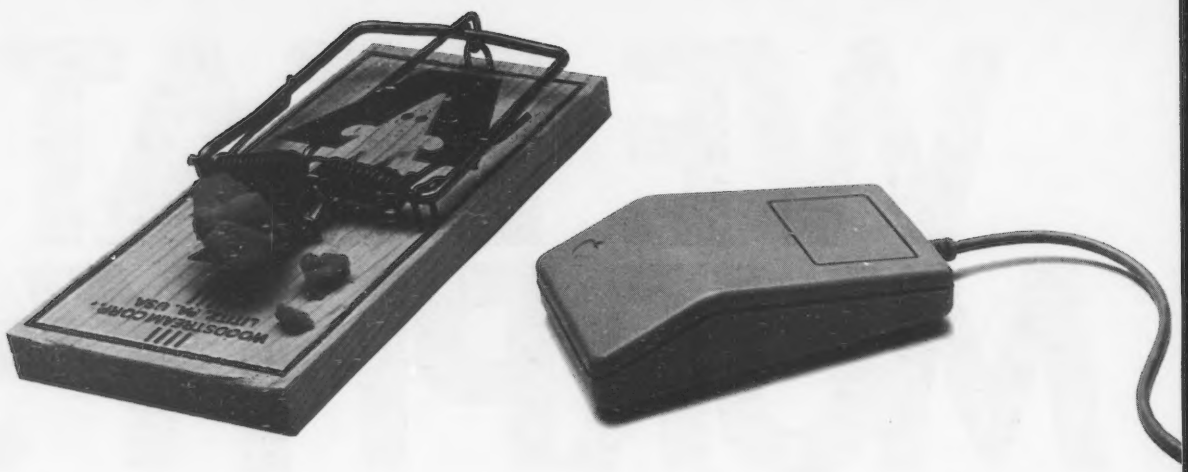

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COMPUTER CAREERS

There are cracks, but glass ceiling is still mostly intact

BY CATHERINE MARENGHI
SPECIAL TO CW

Financial services, high technology, health care and pharmaceuticals offer the brightest prospects for women in information systems, while manufacturing and retailing pose the biggest hurdles, according to industry watchers, recruiters and women IS professionals.

In the financial services industries — insurance, banking and brokerage — women are most likely to hold senior management positions, not just in IS but across the board, according to Catalyst for Women, Inc., a not-for-profit research organization in New York. In a recent cross-industry survey, Catalyst found that 28% of financial services companies — more than any other industry — report that 11% of senior managers are women. All other industries average about 5%.

"The IS management positions I see [women] filling are in banking," says Mary K. Hamm, a partner at the recruitment firm Romac & Associates in Philadelphia. The reason? "Some time ago, the industry didn't pay well, and that created advancement opportunities for women and minorities in IS."

Insurance place to be

Insurance, like banking, has traditionally employed large numbers of women, and many are finding their way to the top. At John Hancock Mutual Life Insurance Co. in Boston, the IS organization is "peppered at all levels" with women, according to Lee Wise, manager of employment. Women make up roughly 45% of John Hancock's IS staff, Wise estimates.

After financial services, Hamm sees pharmaceuticals as the biggest growth area for women, citing Merck & Co., McNeil Pharmaceutical and Smithkline Beecham Corp. as companies with women in IS leadership jobs.

Less high-tech prejudice

Recruiter Cissy Van Balen, president of King & Van Balen, Inc. in Research Triangle Park, N.C., sees the high-tech area as a boon to women because technically oriented companies emphasize capability over gender.

While high-tech companies have relatively few women in IS, Patricia Wallington, chief information officer at Rochester, N.Y.-based Xerox Corp.'s U.S. Marketing Group, says she believes that actually may be good. "Wherever there is a scarcity of a resource, you get evaluations based on true performance, not politics," she says.

That scarcity has hit home for Andrea Cunningham, who is president of her own public relations firm, Santa Clara, Calif.-based Cunningham Communication, Inc. In her more than four years working with one of the top electronics companies in the U.S., Cunningham has interacted with only three women. "The problem is not one of male prejudice, but the fact that too few women are interested in the field," Cunningham observes.

Health care is another information-intensive business where IS talent is highly valued, says Patricia Skarulis, vice president and CIO at Rush-Presbyterian-St. Luke's Medical Center, a $660 million academic medical center in Chicago. Because of major challenges facing health care, including political pressures to reform the system and hold down costs, "This is a particularly good field for IS people," Skarulis notes. "Women in IS can make a real contribution here."

Female barriers

Amid all this promise, however, there are still barriers, women agree. Van Balen points to the "glass ceiling" in all industries, without exception.

"I find that women do well to the point of running a major piece of IS, such as telecommunications or development. But nine times out of 10, the top position is held by a man," Van Balen says.

Jennifer Lammey, an IS project leader at shoe manufacturer and distributor C. J. Clark in Philadelphia, acknowledges that manufacturing is a "tough business for women." In her experience at Clark, the few women in IS tend to get assigned to financial projects, while the more choice manufacturing assignments go to men.

Lammey explains management's reluctance to assign women to manufacturing work: "We have plants in obscure rural areas where you just don't send unescorted women," she says, citing both safety concerns as well as an intolerance toward women managers in outlying areas.

Retailing is another tough field for women. "In retail, there's an MIS old boys' network like no other," Hamm notes. "They know who's VP of what, what jobs are coming up. They're always talking to each other and have successfully excluded women in the process."

One exception is Mervyn's, a Hayward, Calif.-based department store chain where the top IS post is held by a woman. Vivian Stephenson, vice president of MIS, speaks highly of her experience at Mervyn's but says it takes a certain amount of luck to find a company without an ingrained bias toward women.

At Mervyn's, 40% of the 330-person IS staff is women, and not just at the lower levels. Thirty percent of the project leaders, 31% of the managers and 33% of the directors in IS are women.

In the end, the best opportunities for women lie in those companies that, regardless of industry, treat technology as a strategic asset, place a high value on IS talent and focus on results.

"If IS is critical to the business, that's a good place for women to be," says Elaine Bond, senior vice president at Chase Manhattan Corp. in New York.

Indeed, Wallington says she believes the outlook for women IS managers in the 1990s will be bright because of what they can bring to the business.

"Women's holistic style of management — which takes into consideration the environment, the task, the people and the business objective — is one that allows business transformation and change," she said.

Marenghi is a free-lance writer based in Boston.

Awaiting 2017

Women in all occupations are still earning only 74 cents for every dollar earned by men, although the gap is a bit narrower in computer-related fields. According to the U.S. Bureau of Labor Statistics, female computer scientists earned 78.6% of what their male counterparts earned, and female systems analysts earned 82.7%, as of 1990. In both occupations, men outnumbered women almost 2-to-1.

Women have been closing the gap with men at the rate of 1% a year during the past five years, the bureau reported. At that rate, women will achieve equal pay with men in the year 2017.

CATHERINE MARENGHI

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INDUSTRY CURRENTS

Air transport in holding pattern

BY LESLIE GOFF
SPECIAL TO CW

Hiring in the air transportation industry is not exactly preparing for takeoff, although there are a few pockets of opportunity.

The modest hiring expected in the commercial airline and heavy airfreight segments of the industry is mostly a result of the industry's shift to distributed networks.

While core air transport applications, such as reservation systems and aircraft maintenance, require large, centralized databases, companies are looking to the economies of distributed networks for such applications as airport check-in, local accounting, crew scheduling, dispatching and others that do not require a centralized database.

"Those that offer advantages will be decentralized and put on workstations," says Karl Vonnegut, manager of information systems USA at Lufthansa German Airlines.

Stronger skills sought

American Airlines, United Airlines, Southwest Airlines, Lufthansa, Air Express International Corp., Burlington Air Express and Worldcorp, Inc. all say they are extending their personal computer local-area networks and are seeking applications developers with networking experience.

"The stronger your skills in relation to distributed technology, the higher your marketability," notes Don Karmazin, vice president of MIS at United Airlines in Chicago.

However, replacement hiring will be relatively flat this year as IS staff members buckle down in their current positions. Turnover resulting from job swapping is at an all-time low at Burlington Air Express in Tustin, Calif., where 40% of the IS staff participated in a voluntary furlough program between Christmas and New Year's Day. The program was designed to ward off the negative effects of a cyclically weak first quarter.

"We had a higher percentage of participation than any other department," says James Smallman, senior vice president of information services. "The program was very well-received because our employees understand the cost pressures, and historically, we have had to lay people off in the first quarter."

Consolidation in the commercial airline business is making as much of an impact on the air transportation job market as the recession is.

With the closing of Pan American World Airways and Midway Airlines last year, those who are hiring can afford to be choosier, not having to give up PC skills for air transportation experience or vice versa.

Good news

The good news is, the closings do not appear to have created a glut of IS professionals in the industry. However, they may have made it more difficult for those with experience in other industries to crack the market.

For example, at Lufthansa's East Meadow, N.Y., location, two of three new staff members hired recently for PC and LAN support came from Pan Am. "It was to our advantage to hire them because they were qualified in IS and also in the airline industry," Vonnegut says. "We had a more select base to choose from."

Two to four years of airline experience is mandatory in Lufthansa's IS group because, with an IS staff of only 50, the company needs to limit training requirements, Vonnegut adds.

The forces of recession and consolidation are creating small pockets of opportunity. Southwest Airlines in Dallas, for example, is building up to compete with the big guns in a shrinking industry, and Lufthansa plans to transfer some programming tasks to the U.S. from Germany.

"Employment costs are now lower here than in Germany," Vonnegut notes, including the costs of salaries, benefits and recruitment. He says he will add about seven more people to his staff this year in PC LAN support and programming positions.

REPLACEMENT HIRING WILL be relatively flat this year as IS staff members buckle down in their current positions.

At Southwest Airlines, Karen Heltzel, director of IS, said she plans to add eight or nine applications developers to her staff of about 30 as the company brings previously outsourced IS functions in-house to increase cost-effectiveness.

Heltzel adds, however, that although Southwest is ramping up applications development, all noncritical projects have been put on the back burner, and her staff additions this year will be few. "We're not keeping the recession at bay," she says. "We will be profitable, but down from two years ago. Everything we do is very cost-benefit driven."

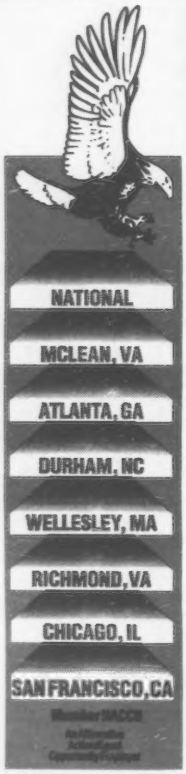
Those IS professionals who will fare best in this climate, according to IS chiefs, will not only have PC and network skills but will demonstrate excellent business analysis and communication skills.

At the airline reservation partnerships, transaction processing experience remains key. Tom Kiernan, president of American's Sabre Computer Services in Dallas/Fort Worth, Texas, notes that reservation systems is the one area that differentiates the airlines from other segments of the services industry.

Other desirable skills vary from shop to shop. Lufthansa favors programmers who speak German, for instance, because most of the company's documentation originates in Germany and must be translated.

Applications developers in air transportation who are considering a move to another industry should look first within the ground transportation industry, where applications and business issues are similar, according to Clarence Johnson, director of IS at Worldcorp, a Herndon, Va.-based airline and heavy airfreight concern.

Goff is a New York-based freelance writer.



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The Registry

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Industry	Computerworld's Audience
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personal computers	73,925
technical workstations	30,943
Software Vendor	160,264
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for medium-scale systems	81,799
for small-scale systems	72,212
for personal computers	66,366
for technical workstations	26,022
Non-CPU Computer Products Manufacturer	34,311
VAR/Dealer/Retailer	44,773
DP Service Bureau/ Contract DP Services	52,375
Consulting/Planning	112,149
Manufacturer (not computers)	229,608
Insurance	62,539
Healthcare	57,788
Banking/Financial Services	123,348
Government Federal/State/Local	107,915
Business Service (except DP)	35,940
Communications Systems	30,264
Public Utilities	43,687
Transportation	49,151
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SOURCE: Skill Survey of Computerworld's Audience, June 1991.

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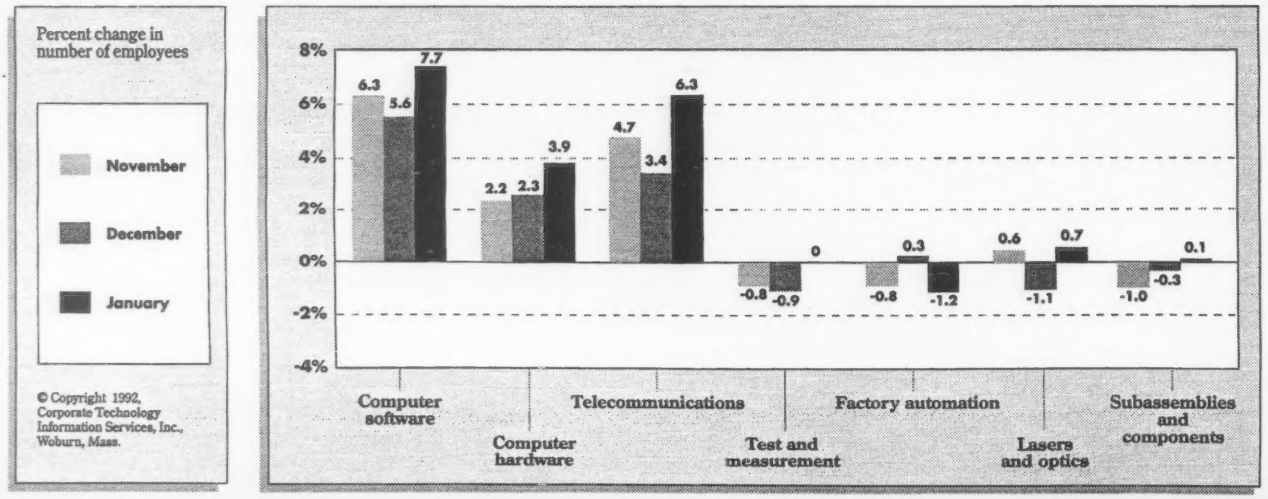

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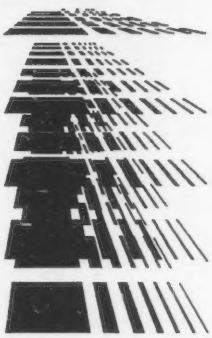

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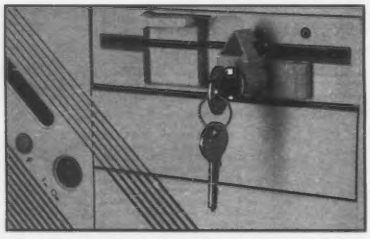

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Few real contenders in the current crop of virus fighters

BY ALAN RADDING
SPECIAL TO CW

Monsanto Chemical Co. in St. Louis felt it had pretty well protected itself from virus attacks when it purchased and installed antivirus software. After all, the product was supposed to detect and then remove any virus that struck. But then the 4096 virus — otherwise known as Frodo — hit.

The software found the virus and identified it, but it didn't clean it out, says Wayne Tripp, a personal computer support specialist at Monsanto. When the company thought the attack was over, the virus went on to infect 20 of its servers and all of its PCs.

Tripp's experience isn't unusual. "Customers are happy with their antivirus products until they detect a virus and find the program can't remove it without giving the computer a lobotomy," says David Stang, director of research at the National Computer Security Association (NCSA) in Mechanicsburg, Pa., a group that focuses on researching and fighting viruses.

Search and destroy

More than ever, users are realizing the importance of detecting and destroying viruses, which are pieces of code that usually attach themselves to an executable file and can result in anything from strange messages on a screen to destroying data on a disk. Varieties of viruses are increasing, and their attacks are growing more common. In a survey by Dataquest, Inc., 63% of 602 respondents experienced at least one virus instance — up from less than 10% the year before.

Where only four viruses existed in 1986, more than 250 viruses were reported in 1990, according to Plymouth Meeting, Pa.-based NSTL, Inc., publisher of the "Software Digest Ratings Report." The NCSA also has 1,200 viruses on record, although only about 10 of these are very common, Stang says.

With the increase in varieties and incidents of virus attacks, the use of antivirus tools is necessary now more than ever. But to be effective, the software must be able to operate on several levels, including identifying both unknown and known viruses, removing the virus and restoring the system.

However, few of the popular antivirus programs are strong in all areas. "There are about a dozen worthwhile products out there," Stang estimates.

Fortunately, there are resources available to help pick out the more worthwhile products. NCSA, NSTL and an organization called the Virus Information Summary List in Santa Clara, Calif., review and test antivirus software (see story at right).

However, for users who want to evaluate products, there are some important attributes to investigate:

- **Impact on performance.** Test how quickly the product scans for known viruses, monitors existing files for changes and performs background checks. Strive for a balance of speed and effectiveness.
- **Ease of use and configurability.** Look for menus, prompts and on-screen Help to see how intuitive and easy to use the program is. The program should also be transparent to the user.
- **Verifiable effectiveness against viruses.** Review published test results to determine how well a program diagnoses and removes viruses and restores data.
- **Impact on system resources.** Look for programs that use 8K bytes or less of random-access memory.
- **Compatibility.** Examine the compatibility with Windows and Netware, which is especially important.
- **False alarm rate.** Check to see how often the program mistakes good code for a virus.
- **Audit trail.** The product should provide a record of scan results and which programs get infected.
- **Vendor background.** Look into the supplier's reputation and its previous experience in fighting viruses.

Protecting against a virus is also expensive. Although individual programs cost only about $99 to just under $200, programs must be installed on every machine to be effective, causing costs to mount quickly.

One major Southwestern oil company that knows the high costs of viruses — having suffered 31 virus attacks in 1991 — reviewed Santa Monica, Calif.-based Symantec/Peter Norton Products Group's Norton Antivirus and Beaverton, Ore.-based Central Point Software, Inc.'s Anti-Virus, each listing for $129. But with 10,000 PCs to cover, the expense was simply too great. "It was going to cost hundreds of thousands of dollars," the oil company's PC analyst explains.

Instead, the company opted for Digital Dispatch, Inc.'s Viru Hunt "because they gave us an unbelievably great price." Although Norton and Central Point do more, he says, the less expensive program provided adequate protection.

A load of prevention

After a purchase is made, keep in mind that there is more to virus prevention than just buying antivirus software. First, Stang says, every antivirus program slows the loading of files as it checks for viruses. Users have to understand the importance of waiting a few extra seconds.

Second, "don't be chintzy with backup," he says. Invest in backup systems that are fast, easy and convenient. Keep an archive of backups because a recent backup of an infected file will likely be infected too.

Finally, don't panic. "More damage may be done by the virus killer than the virus itself," Stang says. If the software does not remove the virus with precision, it can destroy the files it was trying to protect. Avoid desperate, radical actions.

"If you don't know what to do, call the NCSA [(717) 258-1816] or any of the [antivirus] bulletin boards. People will be happy to help you."

Radding is a free-lance writer based in Newton, Mass.

Virus control

It's not easy to choose antivirus software, but published test results are handy when comparing products. The following scored high in NSTL and NCSA virus tests.

NSTL's picks for performance, quality, versatility and usability are:

- Novi from Certus International Corp., Cleveland.
- Central Point Anti-Virus from Central Point.
- Virusafe from Xtree Co., San Luis Obispo, Calif.
- Norton Antivirus from Symantec/Peter Norton.
- Dr. Solomon's Anti-Virus Toolkit from S&S International, Berkhamsted, England.

NCSA's picks for virus scanning capability for viruses are:

- Dr. Solomon's Toolkit.
- Virus Buster, F-Prot (tied for second).
- Central Point Anti-Virus.
- McAfee Associates' Scan/Clean.
- Xtree's Virusafe.

NCSA's picks for virus removal capability are:

- F-Prot, Version 2.0, a shareware product from Reykjavik, Iceland.
- Virus Buster from Leprechaun Software International Ltd., Marietta, Ga.
- Virex-PC from Microcom, Inc., Norwood, Mass.
- Scan from McAfee.
- Central Point Anti-Virus, Xtree Virusafe (tied for fifth).

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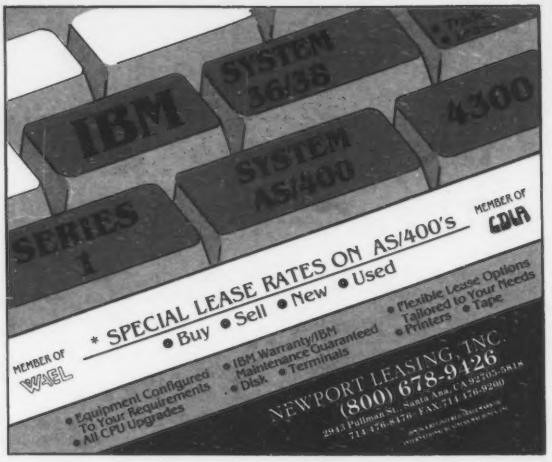

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The BoCoEx index on used computers

Closing prices report for the week ending January 24, 1992

	Closing price	Ask	Bid
IBM XT Model 089	$300	$400	$300
AT Model 099	$500	$525	$475
AT Model 239	$550	$650	$500
AT Model 339	$750	$1,000	$700
PS/2 Model 30 286	$750	$900	$700
PS/2 Model 60	$700	$900	$600
PS/2 Model 80	$2,000	$2,100	$2,000
PS/2 Model 90	$4,300	$4,600	$4,100
Compaq Portable II	$400	$500	$375
Portable 286	$900	$1,000	$800
Portable 386	$1,550	$1,700	$1,500
SLT 286	$700	$900	$600
LTE 286	$1,000	$1,300	$900
Deskpro 286E	$850	$1,000	$800
Deskpro 386/20	$2,000	$2,300	$1,900
Apple Macintosh Plus	$700	$750	$650
SE	$950	$1,050	$950
IIX	$3,000	$3,250	$2,800
IICI	$3,700	$3,800	$3,700
IIFX	$4,500	$4,900	$4,400

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Sealed proposals will be received by CDPA, 301 N. Lamar St., 301 Bldg. Suite 508, Jackson, MS 39201 for the following:

RFP No. 2144, due Fri, 2/28/92 at 3:30 p.m. for 31 IBM compatible workstations, peripherals, and software to add to an existing Novell local area network for the UNIVERSITY OF MISSISSIPPI MEDICAL CENTER.

RFP No. 2146, due Thurs, 2/27/92 at 3:30 p.m. for hardware and softwars needed for the upgrade of an existing IBM AS/400 Model B10 for EAST MISSISSIPPI COMMUNITY COLLEGE.

RFP No. 2149, due Tues, 3/3/92 at 3:30 p.m. for Administrative MIS hardware and software for NORTHEAST MISSISSIPPI COMMUNITY COLLEGE.

RFP No. 2150, due Mon, 3/2/92 at 3:30 p.m. for 13 80386SX-based microcomputers for Office Automation for the MISSISSIPPI STATE HIGHWAY DEPARTMENT.

RFP No. 2151, due Mon, 3/2/92 at 3:30 p.m. for miscellaneous microcomputer peripherals and software for the MISSISSIPPI STATE HIGHWAY DEPARTMENT.

RFP No. 2152, due Thurs, 3/5/92 at 3:30 p.m. for a local area network for the MISSISSIPPI DEPARTMENT OF HUMAN SERVICES.

RFP No. 2153, due Thurs, 3/5/92 at 3:30 p.m. for 327X terminals and 80386SX-based microcomputers for the MISSISSIPPI DEPARTMENT OF HUMAN SERVICES.

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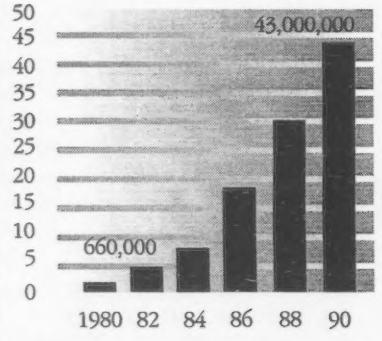
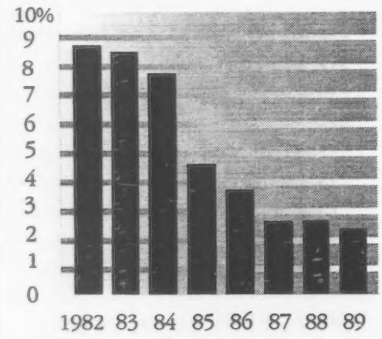


Fewer campus freshman are choosing computer careers**



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- a few examples from our survey-

Skill/Product	Product type	Experts in Computerworld's Audience
IBM PC compatible	hardware	523,573
IBM (all but PC)	hardware	488,965
Digital Equip. Corp.	hardware	214,375
MVS	operating system	257,248
Cobol	language/utility	443,166

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After eight

A number of stocks have jumped more than 50% during the past eight weeks

	Closing price Jan. 28, 1992	Percent gained since Dec. 5, 1991
Network General Corp.	$22.63	71%
Unisys Corp.	$7.75	68%
Western Digital, Inc.	$3.88	63%
Everex Systems, Inc.	$5.50	63%
Computer Associates International, Inc.	$15.00	62%
Storage Technology Corp.	$66.50	62%
Knowledgeware, Inc.	$20.25	59%
Wang Laboratories, Inc./Class B	$3.75	58%
Maxtor Corp.	$8.00	56%
Oracle Corp.	$18.88	56%
Lotus Development Corp.	$32.25	55%
AI Corp.	$10.50	53%
Corporate Software, Inc.	$16.00	52%
Intel Corp.	$62.63	52%
Cambex Corp.	$38.50	51%

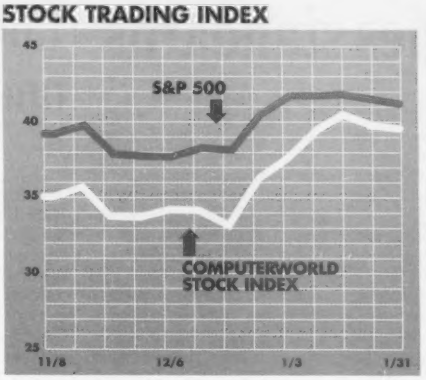
Six-month shakers

Tech stocks have burned up the charts since July

	Closing price Jan. 28, 1992	Percent gained since July 25, 1991
Informix Corp.	$23.00	276%
Maxtor Corp.	$8.00	205%
Software Toolworks, Inc.	$6.13	172%
Network General Corp.	$22.63	166%
Cambex Corp.	$38.50	163%
AI Corp.	$10.50	155%
Oracle Corp.	$18.88	110%
Cisco Systems, Inc.	$74.63	108%
Advanced Micro Devices, Inc.	$20.75	95%
Unisys Corp.	$7.75	94%
Easel Corp.	$42.00	89%
3Com Corp.	$13.50	86%
Intersolv, Inc.	$17.38	85%
Microsoft Corp.	$120.75	83%
Sequent Computer Systems, Inc.	$16.38	82%
Newbridge Networks Corp.	$11.25	76%
Corporate Software, Inc.	$16.00	73%
Computer Associates International, Inc.	$15.00	69%
Picturetel Corp.	$45.75	66%
Network Equipment Technologies, Inc.	$15.75	58%
Silicon Graphics, Inc.	$50.00	57%
Digital Communications Associates, Inc.	$21.75	55%
BMC Software, Inc.	$68.50	57%
Borland International, Inc.	$73.50	57%

CW Chart: Janell Genovese

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- Compaq Computer Corp. dropped 3¼ points last week to close Thursday at 30⅜ after posting disappointing earnings for its fiscal fourth-quarter financials. Sun Microsystems, Inc. reported healthy profits and sales for its second quarter, but its stock fell 2¾ points to 31⅜.
- Among the week's top gainers, Storage Technology Corp. jumped 8¾ points to 69½, following an increase in quarterly sales and the recent release of a high-end line of data storage products.
- Losers included Network Systems Corp., which sank 2¼ points to 15½ last week, after falling 2⅛ points the week before. Electronic Data Systems Corp. closed at 59¼, down ⅜ of a point.
- Hogan Systems, Inc., which is 10% owned by IBM, rose ⅛ of a point to 6⅛ after reporting a quarterly loss. IBM slipped 1⅝ points to 91⅞. It agreed to invest $100 million in France's Groupe Bull last week in a deal involving various technology swaps.

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, JANUARY 31, 1992

TOP PERCENT GAINERS

Storage Technology	25.74
Control Data Corp.	17.28
IPL Systems Inc.	15.12
EMC Corp.	13.64
Micron Technology	12.03

TOP PERCENT LOSERS

Autodesk Inc.	-21.80
Commodore Int'l	-19.08
Compaq Computer Corp.	-13.41
National Semiconductor	-11.59
Advanced Logic Research	-10.53

TOP DOLLAR GAINERS

Storage Technology	15.25
Xerox Corp.	7.38
Borland Int'l	4.00
Legent Corp.	3.63
IPL Systems Inc.	3.25

TOP DOLLAR LOSERS

Autodesk Inc.	-7.88
Compaq Computer Corp.	-4.63
Symantec Corp.	-4.50
Microsoft Corp.	-4.38
BMC Software Inc.	-4.38

Communications and Network Services — Off 0.11%

Exch	52-Week			Jan. 31 Close	Wk Net Change	Wk Pct Change
OTC	13.88	6.75	3 COM Corp.	12.75	-0.38	-2.86
NYS	69.75	55.75	American Info Techs Corp.	62.75	-1.38	-2.14
NYS	41.38	31.63	AT&T	37.25	-1.25	-3.25
OTC	4.25	1.25	Artel Communication Corp.	3.88	0.13	3.33
NYS	52.75	43.00	Bell Atlantic Corp.	46.13	-1.63	-3.40
NYS	54.38	45.38	BellSouth Corp.	49.25	-1.38	-2.72
NYS	60.88	30.25	Cabletron Systems	59.63	-0.88	-1.45
OTC	35.25	12.38	Compression Labs Inc.	26.88	-2.13	-7.33
OTC	5.13	1.50	Data Switch Corp.	3.06	0.19	6.54
NYS	23.50	12.38	Digital Comm. Assoc.	22.88	1.25	5.78
OTC	25.25	14.00	Dynatech Corp.	21.25	1.50	7.59
OTC	12.38	5.00	Fibronix Int'l Inc.	9.25	0.50	5.71
OTC	29.75	9.50	FileNet Corp.	27.00	-0.25	-0.92
OTC	3.75	1.13	Gandalf Technologies Inc.	2.38	0.13	5.56
NYS	4.00	2.13	General Datacomm Inds.	3.75	0.25	7.14
NYS	35.00	28.13	GTE Corp.	31.50	-0.50	-1.56
NYS	63.00	50.00	ITT Corp.	58.00	-1.50	-2.52
OTC	35.00	23.50	MCI Commmunications Corp.	31.38	-1.75	-5.28
OTC	14.50	4.00	Microcom Inc.	10.13	0.25	2.53
NYS	18.13	4.63	Network Equipment Tech.	16.75	0.63	3.88
OTC	23.25	6.75	Network General	23.25	0.38	1.64
OTC	20.00	10.50	Network Systems Corp.	16.63	-0.75	-4.32
NYS	49.13	27.63	Northern Telecom Ltd.	46.75	-1.88	-3.86
OTC	65.00	21.50	Novell Inc.	58.25	0.50	0.87
NYS	82.38	68.00	Nynex Corp.	75.00	-1.25	-1.64
NYS	46.75	38.50	Pacific Telesis Group	42.63	-0.38	-0.87
OTC	11.63	5.63	Penril Data Comm. Ntwks.	8.88	0.13	1.43
OTC	50.75	16.50	PictureTel Corp.	44.75	-2.25	-4.79
NYS	18.63	11.63	Scientific Atlanta Inc.	17.63	-0.13	-0.70
NYS	66.00	49.00	Southwestern Bell Corp.	60.38	-1.25	-2.03
NYS	31.50	21.25	United Telecom	24.00	-0.25	-1.03
NYS	40.75	33.75	US West Inc.	36.63	-1.00	-2.66

Computer Systems — Off 1.77%

Exch	52-Week			Jan. 31 Close	Wk Net Change	Wk Pct Change
OTC	20.75	6.75	Advanced Logic Research	8.50	-1.00	-10.53
ASE	18.50	11.63	Amdahl Corp.	17.75	1.00	5.97
OTC	73.25	40.25	Apple Computer Inc.	64.75	0.13	0.19
OTC	9.13	2.75	Archive Corp.	5.38	-0.25	-4.44
OTC	32.75	14.50	AST Research Inc.	20.50	-1.50	-6.82
NYS	9.38	4.75	Bolt, Beranek & Newman	5.63	0.00	0.00
NYS	21.63	10.13	Commodore Int'l	15.38	-3.63	-19.08
NYS	74.25	22.13	Compaq Computer Corp.	29.88	-4.63	-13.41
OTC	2.63	0.88	Computer Automation Inc.	1.38	0.06	4.72
NYS	13.75	7.50	Control Data Corp.	11.88	1.75	17.28
NYS	19.75	8.88	Convex Computer	14.88	1.50	11.21
NYS	52.25	31.50	Cray Research Inc.	41.75	-3.25	-7.22
NYS	22.50	8.38	Data General Corp.	11.50	-0.63	-5.15
NYS	4.38	1.00	Datapoint Corp.	2.63	0.00	0.00
OTC	36.25	20.25	Dell Computer Corp.	31.88	-1.25	-3.77
NYS	83.00	48.50	Digital Equipment Corp.	50.38	-1.50	-2.89
NYS	30.75	21.25	Harris Corp.	27.75	-0.75	-2.63
NYS	63.38	36.63	Hewlett Packard Co.	59.25	0.00	0.00
NYS	139.75	83.50	IBM	90.13	-3.00	-3.22
OTC	12.00	6.50	Information Int'l	9.50	0.75	8.57
NYS	145.75	105.00	Matsushita Electronics	117.75	1.75	1.51
OTC	20.88	7.88	MIPS Computer Systems	12.25	1.00	8.89
OTC	29.50	10.75	Pyramid Technology	14.75	-1.13	-7.09
OTC	19.75	7.50	Sequent Computer Sys.	16.38	-0.75	-4.38
NYS	54.00	26.50	Silicon Graphics	50.25	0.75	1.52
NYS	51.50	27.00	Stratus Computer Inc.	47.38	0.25	0.53
OTC	38.63	20.75	Sun Microsystems Inc.	30.50	-3.13	-9.29
NYS	17.63	9.50	Tandem Computers Inc.	13.25	0.50	3.92
OTC	4.75	1.25	Tandon Corp.	1.94	-0.19	-8.80
NYS	36.50	23.38	Tandy Corp.	24.38	-1.88	-7.14
OTC	32.38	12.50	Teradata	30.00	-0.50	-1.64
NYS	6.13	1.13	Ultimate Corp.	3.13	0.25	8.70
NYS	8.75	2.50	Unisys Corp.	7.50	-0.50	-6.25
ASE	5.75	2.00	Wang Labs Inc. (b)	3.63	-0.38	-9.38

Software & DP Services — Off 0.29%

Exch	52-Week			Jan. 31 Close	Wk Net Change	Wk Pct Change
OTC	68.50	38.25	Adobe Systems Inc.	61.38	-2.38	-3.73
OTC	12.25	3.50	Aicorp	10.38	-0.13	-1.19
OTC	59.88	28.75	Aldus Corp.	32.50	-3.25	-9.09
OTC	28.50	16.25	American Mgmt. Systems	22.75	-1.00	-4.21
OTC	17.75	9.00	American Software Inc.	17.25	0.00	0.00
NYS	5.38	2.38	Anacomp Inc.	4.75	0.13	2.70
OTC	18.25	12.00	Analysts Int'l	16.75	0.88	5.51
OTC	18.38	6.00	ASK Computer Sys.	18.13	0.00	0.00
NYS	49.00	29.25	Auto Data Processing	42.75	-1.00	-2.29
OTC	62.25	28.25	Autodesk Inc.	28.25	-7.88	-21.80
OTC	40.00	24.50	BGS Systems Inc.	40.00	2.13	5.61
OTC	79.00	33.00	BMC Software Inc.	66.75	-4.38	-6.15
OTC	17.75	8.75	Boole & Babbage Inc.	16.75	0.50	3.08
OTC	86.75	39.50	Borland Int'l	76.00	4.00	5.56
OTC	20.88	7.50	Cognos Inc.	10.50	-0.50	-4.55
NYS	15.75	7.25	Computer Associates	14.75	-0.38	-2.48
OTC	17.75	7.75	Computer Horizons	11.50	0.50	4.55
NYS	82.75	52.25	Computer Sciences	79.00	-3.00	-3.66
NYS	11.25	7.00	Computer Task Group	8.63	-0.13	-1.43
OTC	22.75	12.00	Comshare Inc.	14.38	-0.88	-5.74
OTC	17.00	7.00	Corporate Software	16.00	-0.50	-3.03
NYS	66.13	39.25	General Motors E (EDS)	57.38	0.38	0.66
OTC	18.75	9.25	Goal Systems Int'l	12.75	1.00	8.51
OTC	7.00	2.88	Hogan Systems Inc.	6.25	0.13	2.04
OTC	35.00	13.00	Information Resources	32.25	0.25	0.78
OTC	25.13	3.75	Informix Corp.	24.50	1.25	5.38
OTC	3.63	1.06	Intellicorp Inc.	1.94	0.00	0.00
OTC	31.50	16.25	Intergraph	19.75	1.00	5.33
OTC	12.75	4.50	Interleaf Inc.	12.75	1.13	9.68
OTC	20.25	7.38	Intersolv	17.75	0.00	0.00
OTC	43.25	10.50	Knowledgeware Inc.	20.25	0.50	2.53
OTC	45.00	20.25	Legent Corp.	41.38	3.63	9.60
OTC	40.75	18.00	Lotus Development	33.63	0.88	2.67
OTC	19.75	11.50	Mentor Graphics	18.63	1.00	5.67
OTC	32.00	9.75	Micrografx	26.00	-0.25	-0.95
OTC	133.25	60.50	Microsoft Corp.	120.25	-4.38	-3.51
OTC	19.75	7.00	Oracle Systems	18.50	0.00	0.00
OTC	10.00	4.88	Phoenix Technologies	7.88	-0.88	-10.00
OTC	25.25	9.00	Platinum Technology	20.25	-1.25	-5.81
NYS	72.75	43.25	Policy Management Sys.	68.13	0.88	1.30
NYS	38.88	17.13	Reynolds & Reynolds	38.88	1.50	4.01
OTC	16.75	6.75	Ross Systems	14.50	-0.13	-0.85
OTC	31.50	19.75	SEI Corp.	30.25	0.50	1.68
OTC	24.13	15.13	Shared Medical Systems	23.25	0.25	1.09
OTC	35.25	12.50	Software Publishing Corp.	21.25	-0.25	-1.16
NYS	24.88	8.75	Sterling Software	21.75	0.50	2.35
OTC	21.00	11.75	Sungard Data Sys.	20.50	0.50	2.50
OTC	51.00	18.50	Symantec Corp.	45.00	-4.50	-9.09
NYS	15.50	4.75	System Center Inc.	12.38	-0.88	-6.60
OTC	26.50	8.34	System Software Assoc.	25.50	-0.25	-0.97

Semiconductors — Off 0.66%

Exch	52-Week			Jan. 31 Close	Wk Net Change	Wk Pct Change
NYS	21.38	7.25	Advanced Micro Devices	18.88	-1.63	-7.93
NYS	12.50	7.00	Analog Devices Inc.	10.13	0.25	2.53
OTC	13.50	7.00	Chips & Technologies	10.00	-0.88	-8.05
OTC	63.00	38.50	Intel Corp.	59.88	-2.50	-4.01
NYS	12.50	6.50	LSI Logic Corp.	8.88	-0.88	-8.97
NYS	19.13	10.88	Micron Technology	18.63	2.00	12.03
NYS	79.88	54.00	Motorola Inc.	76.63	-0.13	-0.16
NYS	9.00	3.88	National Semiconductor	7.63	-1.00	-11.59
NYS	47.63	26.00	Texas Instruments	35.75	0.75	2.14
OTC	12.25	5.88	VLSI Technology	8.63	0.00	0.00
OTC	16.75	4.50	Weitek	6.25	0.38	6.38
ASE	6.75	2.00	Western Digital Corp.	4.25	0.38	9.68

Peripherals & Subsystems — Up 1.79%

Exch	52-Week			Jan. 31 Close	Wk Net Change	Wk Pct Change
OTC	2.75	1.00	Apertus Technologies	1.38	0.06	4.72
OTC	19.50	8.25	Banctec Inc.	18.00	0.00	0.00
OTC	40.50	7.88	Cambex Corp.	38.50	0.50	1.32
ASE	11.75	7.00	Cognitronics Corp.	10.00	0.00	0.00
NYS	29.75	12.50	Conner Peripherals	19.13	-0.25	-1.29
ASE	25.63	9.63	Dataram Corp.	22.25	-2.25	-9.18
OTC	15.63	4.88	EMC Corp.	15.63	1.88	13.64
NYS	50.50	38.63	Eastman Kodak Co.	50.50	1.75	3.59
OTC	11.25	4.75	Emulex Corp.	6.13	-0.25	-3.92
OTC	24.00	14.75	Evans & Sutherland	19.75	-0.75	-3.66
OTC	10.25	4.00	Iomega Corp.	9.88	-0.25	-2.47
OTC	28.25	14.50	IPL Systems Inc.	24.75	3.25	15.12
OTC	9.50	1.63	Maxtor Corp.	8.75	0.38	4.48
OTC	18.00	5.50	Micropolis Corp.	10.13	-1.13	-10.00
NYS	98.75	83.13	3M Corp	91.00	-2.25	-2.41
OTC	10.75	3.50	Printronix Inc.	4.38	0.00	0.00
NYS	26.75	11.25	QMS Inc.	14.63	-0.25	-1.68
OTC	18.25	8.88	Quantum Corp.	15.13	0.63	4.31
NYS	11.00	5.13	Recognition Equipment	10.38	0.25	2.47
OTC	11.50	5.38	Rexon Inc.	10.13	-0.38	-3.57
OTC	19.88	7.13	Seagate Technology	12.88	0.00	0.00
NYS	74.50	26.25	Storage Technology	74.50	15.25	25.74
NYS	30.88	16.00	Tektronix Inc.	19.88	-0.25	-1.24
NYS	13.53	6.16	Televideo Systems	8.38	0.00	0.00
NYS	77.13	48.13	Xerox Corp.	77.13	7.38	10.57

Leasing Companies — Off 0.10%

Exch	52-Week			Jan. 31 Close	Wk Net Change	Wk Pct Change
OTC	16.25	9.25	Amplicon Inc.	13.50	0.00	0.00
NYS	28.38	18.13	Comdisco Inc.	19.88	-0.25	-1.24
OTC	16.25	10.50	LDI Corporation	14.88	0.13	0.85

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OSI forum untangles standards

BY ELISABETH HORWITT
CW STAFF

WASHINGTON, D.C. — The OSI Network Management Forum last week proposed a "roadmap" to help users and vendors escape the tangle of overlapping, semicompatible and semifinalized network management "standards."

The forum, together with a dozen other standards organizations and user groups, announced last week the Open Management Roadmap, an architecture that will mesh the best elements of several standards, including the Distributed Management Environment (DME), Open Systems Interconnect (OSI) and Simple Network Management Protocol (SNMP).

The proposed environment could help resolve an impasse that has impeded the standards development process for years: users and vendors each waiting for the other group to demonstrate commitment to a particular network management standard before spending money.

All talk, no action

Users complain that vendors have trumpeted support of standards such as OSI Common Management Information Protocol (CMIP) but provided little in the way of real products — and far less in the way of true multivendor interoperability.

"I've talked with other network managers, and they all say the same thing: 'We have to quit relying on Netview; the standards process is too slow, and OSI is probably dead,' " said Michael Disabato, manager of McDonald's Corp.'s network design group.

Vendors have their own complaints. "Users are not yet demanding the kinds of standards-based solutions in dollars to incite us to build products," said Bill Gilbert, AT&T's director of network management and president of the OSI Network Management Forum.

AT&T has been discouraged by the fact that there were at least three versions of CMIP — one from the U.S. government, one from the OSI Network Management Forum and one from the International Organization for Standardization (ISO) — a spokesman said.

Roadmap should address all of the above problems, Gilbert said. The consortium "goes directly at the issue of resolving the confusion" about which version of key network management standards to use, he added.

The consortium has already been working for several months on "Omnipoints," or a set of goals that specify what network management standards will be delivered at what point in time.

Omnipoint 1, officially released by the OSI Network Management Forum last week, will address reporting, logging and filtering of alarms, scheduling management, trouble ticketing, configuration management, security management and path tracing. Scheduled to ship in August, it will also merge the Forum's CMIP protocols with the ISO's X700 CMIP standard.

This merger should push IBM to finally support the Forum's CMIP, an IBM spokeswoman said. The current CMIP will run only on a full OSI stack, while Omnipoint 1 will run on top of other protocols, such as Systems Network Architecture, a spokeswoman said.

Users questioned whether Roadmap will be enough of a shortcut to a consistent set of integrated network standards.

For example, 3M Co. is interested in both CMIP and DME but is meanwhile implementing SNMP wherever the protocol works, according to Mark Anderson, a senior network analyst. "It's good that everyone is coming together to do this, but I wish they had done it a couple of years ago."

Good point

The following are Omnipoints on the Open Management Roadmap:

Standards groups: Includes the Open Software Foundation, the Corporation for Open Systems, Unix International and X/Open Consortium Ltd.

User groups: Includes the National Institute of Standards and Technology on the government side and the User Advisory Council on the commercial side.

Initial product availability: August.

Key goals:

- A "recipe" for network management that includes specific protocols and the specific management functions they address.
- Finalizing still unfinished protocols.
- A time frame for vendors to implement protocols.
- Educating users on linking various components and protocols.

Public carriers push one-stop management

BY ELLIS BOOKER
CW STAFF

WASHINGTON, D.C. — U.S. Sprint Communications Co. last week unveiled Insite Executive, the first piece of a management platform designed to one day allow its customers to monitor and control all of their Sprint network services from a single Unix workstation.

The Sprint approach is hardly new. Rather, it points to a trend among the public carriers to develop powerful management systems that give customers a way to monitor public networks as easily as they manage their local- and wide-area networks.

For example, MCI Communications Corp. has a comparable product slated to be out later this year.

AT&T Communications was the first carrier to try and consolidate its service management systems under one platform: the Accumaster Integrator. The firm has stumbled, however, because the suite of functions found in three available service management workstations is not available through the Integrator.

Sprint officials differentiated their product from the pack, arguing that Insite is preferable to a hodgepodge of products stamped with the same name. "We built five separate systems . . . and modified a dozen others" for Insite Executive, said Gerry F. Euston, vice president of business product marketing.

Currently, however, the only service controllable under Insite Executive is Sprint 800, with a service manager Sprint calls 800 Call Director. Euston said that later this year, Insite would be outfitted with additional service managers.

Sprint has committed to adding interfaces to existing network management platforms and plans to comply with Open Systems Interconnect standards and de facto standards.

Insite Executive, which will be commercially available in May, runs under X Window System and the Open Software Foundation's Motif on a Sun Microsystems, Inc. Sparcstation. With the workstation, the system will cost $2,000 per month; the 800 Call Director service will cost $595 per month.

MCI joins in

MCI's upcoming Integrated Network Management System (INMS) will allow customers to monitor and reconfigure their VNET virtual networks, 800 circuits and both switched and private line data services.

Announced last September, INMS 2.0 is currently in an alpha-test stage, according to Jay Simon, MCI's senior manager of network management services.

"We've got about 15 to 25 customers on INMS 1.0," Simon said. Prices for INMS 2.0 have not been set.

Like the long-distance companies, local exchange companies have recognized the desirability of consolidated service management platforms.

Ameritech Information Systems, a division of Ameritech Corp., for example, is developing what it calls Ameritech Quantum User Access, which will allow customers to monitor and provision the local exchange services offered by Ameritech's telephone operating companies.

Recession dampens user mood to dismay of Comnet exhibitors

The sprawling Communication Networks Conference and Exposition (Comnet) '92 show managed to cover all foreseeable networking bases, although the recession had its impact. *Computerworld* staff members cruising among the exhibits, press briefings and conference sessions pulled out the following info bytes:

■ Despite the steady stream of visitors — first-day Comnet attendance was reportedly up 14% — there was little excitement or enthusiasm on the show floor. Several vendors, asked if attendees were in a "buy" or "browse" mode, chose the latter. "Necessity spurs 30% of all sales . . . The other 70% is predicated on conditions and variables," said Thomas A. Cargil, president of Delta Products Co., a systems integrator in Cleveland. That means the economy, right?

■ A consortium of internetworking vendors said it will form a multivendor frame-relay certification lab. It will certify vendor-to-vendor interoperability, not vendor-standard conformance testing. The founders include Newbridge Networks, Dynatech Communications, Advanced Computer Communications and Fastcomm Communications.

■ "Reports of the 3745's demise are exaggerated," was one of the messages IBM delivered at a show briefing. It had previously promised a fast-packet switch designed to support high-speed, LAN-to-LAN, multiprotocol networking. IBM spokesman Jean Lorrain said that the new switches — code-named Paris — will not supersede the 3745 for the foreseeable future. Delivery is several years away — at least.

■ In the absence of hot new products, one could count on "The Vision Thing." Bellcore President and CEO George H. Heilmeier outlined a three-point plan for a national information infrastructure that would comprise of "pervasive, broadband, intelligent networks" by the beginning of the 21st century.

■ What was introduced was not always news. DEC officially announced a June delivery date for Decnet/OSI for VMS — only a year and a half late, which probably does not disturb many pure VMS shops. However, the first release will not include the promised support of TCP/IP. No date was set.

AT&T announced the Definity System G3 PBX system, which is said to (finally) merge the firm's incompatible System G1 and G2 product lines onto a single platform with common software-based features, functions and applications. G3 is also said to be the first PBX system to run on a RISC platform, which AT&T claims will increase the system's ability to process applications such as PBX-to-computer links by as much as 400%. On a sour note, AT&T said it will raise prices on its PBX line, averaging 8% per system, effective April 6.

■ Cabletron Systems announced a new Multimedia Media Access Center wiring hub family that incorporates Silicon Graphics' Indigo RISC-based PC. This allows the hubs to run graphics-based network mangement software co-developed by the partners.

Novell, Compaq tighten ties

BY JIM NASH
CW STAFF

Novell, Inc. raised information systems managers' eyebrows last week by reinforcing a strategic relationship with Compaq Computer Corp. and by disclosing delivery dates for a runtime version of high-end Netware as well as hub management and multiprotocol routing services.

Compaq and Novell reaffirmed that they are working together on a beta-test version of Novell's System Fault Tolerance Level III (SFTIII) product, which duplicates entire file servers and the workstations on which they run.

Eckhard Pfeiffer, Compaq's president and chief executive officer, said the two companies have products other than SFTIII in the works, but he refused to elaborate further.

The open-ended agreement merely puts on paper the duo's plans to build value-added products based on Netware and to optimize each of their product lines to take advantage of the other's.

"This is a total nonissue to me," said Lynn Kasel, computer systems manager at Floathe Johnson Associates in Kirkland, Wash. "Everybody says everything, and then things aren't delivered on time. I'd have to get [a product from the two companies] on my desktop and try it."

"There's not much of interest here," said Brooks Hilliard, president of the consulting firm Business Automation Associates, Inc. in Phoenix. "If in fact something happens [in the way of new products], Compaq gets an immediate bonus." This is particularly true of SFTIII, he said.

"Novell is trying to be on everyone's good side," Hilliard said, referring to other business agreements that the Provo, Utah-based networking monolith has signed with hardware leaders such as IBM and Hewlett-Packard Co.

Novell Chairman Noorda *(left) and Compaq CEO Pfeiffer reaffirm companies' ties*

Extended availability

Novell also said its Netware Runtime Version 3.11 is now available to OEMs. Runtime is a stripped-down version of Netware onto which OEMs and end users can load specific software modules they require. Hub Services Version 1 and Multiprotocol Router Version 1 are two examples.

The hub, co-developed with Intel Corp., allows for as many as 96 ports to be installed on a single server and is expected to be available in late March for $250. The router is scheduled for a late February ship date, listing for $995.

Mike Wegerbauer, network manager for the University of California at Los Angeles' Psychology Department, said Runtime gives him the ability to pick up just the services he needs without having to purchase an entire Netware 3.11 setup for remote offices, for example.

It is the pricing of the router, however, that irked Wegerbauer. By their nature, software routers are slower than hardware routers from vendors such as Cisco Sytems, Inc., Wegerbauer said. He added that he could overlook that aspect if Novell's multiprotocol router did not cost as much as Cisco's median-priced devices.

He said the logic behind the pricing makes sense for Novell only. If the router were priced much lower, it would be more cost-effective to buy Runtime with the router and a few other services and skip Netware 3.11 altogether.

Merrill Lynch alters net to cut costs, speed data access

CONTINUED FROM PAGE 1

thornier challenge as he and his staff work around equipment that has not yet depreciated and a spaghetti bowl of cabling plants. However, he has begun the process at the firm's Manhattan systems center with some straightforward economic guidelines.

"We are not going to count equipment that has depreciated as part of the cost to revamp our infrastructures," he explained. "We will subtract the existing usable environment from the restructured environment to determine the cost of the new infrastructure at a particular site. Then we can determine when we'll hit our return on investment."

Overall shift

The firm's overall shift from mainframe-based applications to LAN-based computing has been largely allowed by advances in router technology (see story below). That shift is in large part because of significant savings in processing costs. For example, one high-powered Merrill Lynch trading unit cited reduction in computing cycle costs from $2 million a year to less than $1 million. "This is the flavor of what gains will be realized with Unix," Curatolo said.

Sun Microsystems, Inc. Unix workstations communicating via Transmission Control Protocol/Internet Protocol were survivors of a vendor/equipment pare-down. Others include Novell, Inc. and Banyan Systems, Inc. LANs, Cabletron Systems, Inc. and Synoptics Communications, Inc. intelligent wiring hubs and Wellfleet Communications, Inc. routers.

"What's happening in financial communications is in part a reflection of what the corporate sector is going through," said Marshall Caro, president of PI Systems Ltd., a New York systems integrator that has worked with several Wall Street firms. "They are downsizing from mainframes as a reaction to the inability of MIS departments to address the needs of powerful user groups that are profit centers."

Curatolo agreed that next to cost savings, Merrill Lynch's goal with LANs is "departmental control of applications, and we don't want to have to depend on the systems group."

Caro added that the likes of competitors Goldman, Sachs & Co. and Salomon Brothers, Inc. have also set up organizations such as Curatolo's "to define the role of a central group to provide common network facilities" corporatewide.

Super database

Merrill Lynch's computing direction, much like that of other large shops, is that the mainframe is likely to become a "super" database or storage device that will probably also handle the heavy-duty processing of month-end statements and high-volume transactions.

"From the client's view, the LAN is the front-end access to the mainframe," Curatolo said. The company retains eight IBM mainframes in its two data centers in Manhattan and Staten Island, N.Y.

The biggest hurdle with the LAN movement is staffing, Curatolo said. He explained that an effort is under way at Merrill Lynch to ease systems personnel into LANs via outside training and hands-on experience with downsizing projects.

Novell integrated net scheme manages all

CONTINUED FROM PAGE 1

The system's Server Schematic feature, which is said to collect server configurations centrally, "will save me a lot of shoe leather walking around finding out what everyone's addresses are," said Ed Ackerman, a LAN manager at Consolidated Insurance Group, Inc.

The system's Notification Management element, which collects real-time alerts, "can let me know what's going on so I can fix something before it fails," said Wayne Halterman, regional LAN coordinator at the U.S. Bureau of Reclamation, commenting on the documents.

Both Ackerman and Halterman waxed enthusiastic about Server Schematic's expected icon-based presentation of key information about distributed servers and peripherals.

"It would be nice to have a tool that gives the entire [distributed LAN] schematic, instead of having to log on and off of 18 file servers," Halterman said.

The system should please users by running on both OS/2 2.0 and DOS Windows, according to a source close to the company. Novell's previous announcement, Netware Management Map, turned off some users because it ran only on OS/2 2.0.

> NOVELL'S PREVIOUS announcement, Netware Management Map, turned off some users because it ran only on OS/2 2.0.

Users should also be pleased at the new system's low base price, which should cost the average corporation "in the hundreds of dollars," according to one consultant briefed by Novell.

Of primary importance are the promised open application programming interfaces that enable third-party software vendors to port their packages to Novell's system, said Jamie Lewis, vice president of information services at The Burton Group, Inc. "Novell needs to build a platform on Netware, then let other people build applications."

Indeed, recent third-party announcements promise to extend Novell's management platform far beyond its current capabilities. Remedy Corp., for example, has stated that it will port its LAN administration software to Novell's platform as soon as the specifications become available, Lewis said.

Novell's system anticipates network operating system rivals Banyan and Microsoft, both of which are late delivering their integrated management platforms. More problematic to the Novell/IBM partnership, Novell's platform offers a far more comprehensive LAN management solution than either IBM's LAN Network Manager or its Netview/6000, Hyland said.

New wave routing

Merrill Lynch's move to local-area networking has been spurred by advancements in multiprotocol routing technology, said Vincent A. Curatolo, vice president of distributed systems and services.

Routing, in the form of about 40 Wellfleet Communications devices at the firm, has allowed Merrill Lynch to move mission-critical applications such as trading, inventory tracking, human resource programs and databases to LANs. The new wave in router technology has enabled the financial services firm "to achieve a level of interoperability that didn't exist two years ago" by mixing multiple protocols on one wire, Curatolo explained. He added that routing allows network segmentation, which is critical for keeping network traffic uncongested. "We don't use bridging too much anymore," Curatolo said, explaining that the devices' lack of segmentation capabilities tended to create one huge overloaded network.

The switch from bridging to routing meant that "what might have taken 10 seconds to access a file server now takes one second," Curatolo said.

JOANIE M. WEXLER

NEWS SHORTS

3Com bids to buy hub maker

Ignoring a history of failed merger efforts, 3Com Corp. last week bid to buy a big chunk of European market share by agreeing to purchase the data networking products business of the UK's reported hub leader, BICC Group PLC. The move, expected to be completed next month for $25 million in cash and 500,000 shares of 3Com stock worth about $5 million, should render 3Com the fourth largest hub maker, The Yankee Group said. In 1990, 3Com had about 2% of the global hub business, while BICC trailed Synoptics Communications, Inc. and Ungermann-Bass, Inc. in Western Europe with 14.6% of that market, according to International Data Corp.

System V Release 4.1 code offered

Unix International, Inc. has announced access for its members to prerelease source code for the low-end desktop System V Release 4.1 program under development by Unix System Laboratories, Inc. The source code will allow members to start development and speed time-to-market for binary products.

OMG adds members

Oracle Corp. in Belmont, Calif., and The Boeing Co. in Seattle have joined the Object Management Group (OMG), which is trying to promote the standardization of object-oriented software technology. Total membership now stands at 200. Oracle has said the firm is developing an object-oriented version of its core database, to be called Version 7.1. It will not be delivered until 1993 at the earliest. Separately, the OMG said it has issued a request for information regarding object services, which govern services for naming objects and object interchange.

HP gets nod from naval center

In a $7 million, one-year contract, the U.S. Naval Weapons Center in China Lake, Calif., is buying 40 Hewlett-Packard Co. Apollo 9000 Model 720 workstations, 50 HP X Window System terminals and a variety of software tools and peripherals for its advanced combat-simulation system. The China Lake facility trains fleet pilots and military personnel, who learn to respond to simulated battle conditions on high-performance graphics workstations.

Unisys backs Motorola chips

Unisys Corp. has picked Motorola, Inc. to provide it with application-specific integrated circuits (ASIC). Previously, both Motorola and Intel Corp. provided Unisys with ASICs, which Unisys then customized on its own fabrication lines. Unisys estimated it will save up to $200 million every two to three years through standardizing its ASIC supply with Motorola.

Kuwaiti firm beats back Microsoft

Alalamiah Electronics Co. in Kuwait has won its lawsuit against Microsoft Corp. and two former Alalamiah employees. A jury in U.S. Federal Court in Seattle found that Alalamiah's contracts with Iskandar Morcos and Mohammed Rashid were enforceable in Washington state and said the two had breached their contracts by developing competing products at Microsoft. A final ruling expected midmonth could make permanent a preliminary injunction that prohibited the two men from working on products competing with Alalamiah and prevented Microsoft from receiving confidential Alalamiah information.

Short takes:

Spinnaker Software Corp. is expected to ship versions of its Personal Access database query packages for the Oracle and Borland International, Inc. Paradox databases this month . . . Dennie M. Welsh, president of IBM outsourcing subsidiary **Integrated Systems Solutions Corp.**, joins the firm's board of directors . . . **Compaq Computer Corp.** said it will recycle nickel cadmium batteries in coordination with Environmental Protection Agency-approved recycling centers. Compaq portable users can call (800) 524-9859, and they will be sent a preaddressed, postage-paid mailer.

Bush budget kind to info tech

FY '93 federal budget proposes double-digit growth on some IS programs

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — In his proposed federal budget, President Bush last week called for double-digit growth in government spending on information technology initiatives, including a 23% increase for the High Performance Computing and Communications program.

The bipartisan program, which Bush would fund with $803 million next year, would spawn the development of high-performance computer hardware and software and a 1G bit/sec. National Research and Education Network. The budget also endorsed recent recommendations from the U.S. computer industry to broaden the scope of the program and to allocate more funds to software research.

"In my opinion, there is no other single initiative that will have as widespread an impact on business, education, government and society in general," said D. Allan Bromley, the president's science and technology adviser.

Bush also asked Congress to make the 20% tax credit for research and experimentation (R&E) permanent. The credit, which has had a number of temporary extensions since it was enacted in 1981, is set to expire June 30 [CW, Nov. 25].

The budget also proposed extending for 18 months a moratorium on a tax rule that would require U.S. companies with overseas operations to allocate a portion of their domestic R&E expenditures to income earned abroad. Business has urged that the moratorium be made permanent, saying it would otherwise result in a loss of tax credit.

The president also called for a new Investment Tax Allowance that would allow an additional 15% write-off on equipment purchased this year, and he called again for a reduction in the capital gains tax rate to 15.4%.

"Our overall assessment [of the budget] is positive. It's particularly strong on the tax side. The so-called 'growth package' is very positive," said John Mancini, senior vice president at the American Electronics Association. "On the technology side, the building blocks are there."

The budget calls for a 36% increase, to $68 million, for the Advanced Technology Program, the Department of Commerce's government-industry program to help U.S. industry develop fundamental new technologies in computers and other areas.

Computing it up

The fiscal 1993 budget proposed by President Bush would greatly aid information technology investments in both the private and public sectors

FY '93 budget proposal

Programs:	(in millions)	Percent increase from 1992
High-performance computing and communications	$803	23%
Advanced materials and processing	$1,821	10%
Advanced manufacturing R&D	$321	27%
Agencies:		
National Science Foundation		
Computer and information science	$272	29%
National Institute of Standards and Technology		
Computer systems	$17	45%
Electronics and electrical engineering	$28	18%
Manufacturing engineering	$13	35%

CW Chart: Janell Genovese

Advance orders give boost to Storage Tek's Iceberg

BY MICHAEL ALEXANDER
CW STAFF

NEW YORK — Storage Technology Corp.'s much-anticipated Iceberg loomed into view last week, aided by orders for 140 of the redundant arrays of inexpensive disks (RAID) subsystems.

The Boulder, Colo., company expects to sell as many as 1,200 subsystems next year, said Storage Tek Chairman Ryal Poppa at a glitzy multimedia presentation here.

Storage Tek's Poppa *expects to sell 1,200 subsystems next year*

Shared Medical Systems Corp. in Malvern, Pa., has a 100G- to 200G-byte Iceberg on order. Assuming it performs as advertised, "we will sweep the floor with Iceberg and within two years, as our leases expire, we will replace everything in the shop," said Joe Novoshielski, information systems manager at the company.

Shared Medical Systems provides data processing services to 700 clients around the country and has about 2T bytes of data stored mainly on IBM 3390 disk subsystems.

Storage Tek, which spent $145 million developing Iceberg, joins EMC Corp. as the only companies now marketing disk-array storage subsystems for the IBM mainframe market [CW, Jan. 20].

Iceberg is aimed at corporations and organizations that have massive storage requirements and must have "access to mission-critical data 24 hours a day, seven days a week," Poppa said.

The minimum Iceberg configuration stows about 100G bytes of data onto 32 Hewlett-Packard Co. 5¼-in. disks and is priced at $1.3 million. The maximum configuration packs about 400G bytes on 128 HP disks and is priced at $3.6 million. The price includes the 9200 disk-array controller, one to four 9210 disk-array units and software. Volume shipments are expected in the second half of this year.

"What will be important is that the early customers have a positive experience with the product," said Robert Callery, a senior analyst at Technology Investment Strategies Corp. in Framingham, Mass. "The reliability and performance that come out of the early sites will be watched very, very closely by potential customers and competitors."

Disk-array subsystems represent "the wave of the future," and IBM and several other vendors are preparing to jump into the market within the next two to three years, Callery said.

The subsystems, which take up only 40 sq ft of floor space, will be shipped to beta-test sites in the second quarter of this year, according to the company.

Sparcstation opens to third-party graphics

Soon-to-be-released Solaris 2.0 could raise the competitive stakes for other workstation vendors

BY MARYFRAN JOHNSON
CW STAFF

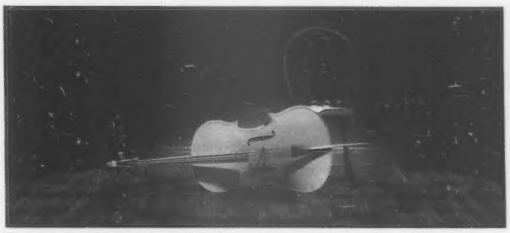
MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. last week cracked open a trio of hardware interfaces that were formerly closed to outside developers. Designed to encourage third-party graphics vendors to jump aboard the Sparcstation platform, the change also raises the stakes for workstation competitors such as IBM, Hewlett-Packard Co. and Silicon Graphics, Inc.

In the upcoming Solaris 2.0 operating system, scheduled for midyear shipment, graphics vendors will find a new operating system layer that hooks them directly to the underlying hardware platform. This layer includes one new piece — an XIL imaging library — and two newly opened versions of the XGL 2-D/3-D geometry and X/News Windows interfaces.

The operating system layer is where some 20 different application programming interfaces (API) hook into the platform. Those APIs span a range of de facto industry standards such as the Iris GL graphics library from Silicon Graphics or the Graphical Kernel System, an international standard two-dimensional graphics library.

Since Solaris 2.0 will also run on the Intel Corp. platform, analysts noted that Sun is broadening its reach with third-party vendors in that market as well.

By exposing its low-level graphics hardware interface, Sun is removing a costly barrier for third-party vendors, enabling them to optimize the performance of their products on the Sun hardware.



By attracting more *third-party graphics vendors, Sun hopes to make 3-D images like this one widely available on its systems*

The downside of the strategy, however, is that it could "lead some vendors to decrease their portability [to other platforms] in exchange for performance," cautioned David Pensak, corporate adviser for computer technology at Du Pont Co. in Wilmington, Del.

Jerry Grier, manager of engineering standards and support at Lockheed Missiles & Space Co. in Sunnyvale, Calif., took a more upbeat stance. "This gives Sun the opportunity to say they're still competitive and can take on more software packages from different vendors," he said. Lockheed is currently installing 50 Sparcstations for computer-aided design applications that previously ran on older HP/Apollo workstations.

Five vendors signed on last week as new partners in Sun's "Open Graphics Initiative," including Evans & Sutherland.

"This is a major boost for a company like Evans & Sutherland, which has been viewed as an outsider with proprietary technology," said Jeffry Canin, an analyst at Montgomery Securities in San Francisco.

Evans & Sutherland specializes in high-performance, three-dimensional graphics products — an area in which Sun has been notably weak in the past, Canin added.

Seeing is believing ACE

CONTINUED FROM PAGE 1

The Santa Cruz Operation, Mips and Compaq Computer Corp. — another 11 vendors recently joined the executive board, each pitching in a $50,000 fee toward marketing and public relations.

Many of the ACE members themselves — numbering 250 companies now — readily acknowledged that the fog surrounding their strategies and goals has been difficult to penetrate.

"It's getting a little bit better, but to be honest, it's been very confusing in the past," acknowledged Mark Yahiro, manager of SCO's Open Desktop product line.

Rikki Kirzner, an analyst at Dataquest, Inc. in San Jose, Calif., was even more direct. "They're trying to present a united front, but you've got 16 board members that are deadly competitors and hate each other's guts, and they're trying to work together toward a common goal," she said.

There are some points of light cutting through the haze, however. The first ACE-compliant products will begin appearing this summer and throughout the fall, and software developers are expected to be in full-scale development on both platforms by fall.

The "ACE-compliant" label is a subtle but important distinction from the "compatible" descriptions currently used for products such as DEC's line of Unix-based Ultrix machines.

ACE-compliant will mean the product actually meets the specifications set forth in the Advanced RISC Computing hardware definition or runs under one of the new ACE operating systems.

At this point there are two hardware platforms and three operating systems involved: Intel Corp.'s 80386/I486 and Mips' R4000-based reduced instruction set computing (RISC) platforms, which will each run Microsoft's Windows New Technology (NT), SCO's Open Desktop for ACE and a "light" version of System V Release 4 from Unix System Laboratories, Inc. (USL).

NT on the way

Considered a crucial piece of the ACE puzzle, Windows NT is supposed to ship by year's end, although some industry observers predict that it will not appear until 1993. Both SCO and USL plan to have their Unix/ACE operating systems in user hands by the end of this year, according to company officials.

"The overwhelming majority of shipments under ACE will be Intel running Windows NT," said Tom Kucharvy, president of Summit Strategies, Inc. in Boston. The Unix vendors in ACE are acutely aware of that likelihood, since one of their primary goals is to wrench the desktop away from Microsoft.

Yet whatever the rivalries may be, Microsoft's commitment to ACE stands firm, said Carl Stork, director of Windows NT business development at Microsoft. "We think there are significant benefits to software developers and customers in having machines from many different manufacturers running the same software," Stork said.

The intense competition within ACE is what makes it such an oddball organization. Even calling ACE a consortium is overstretching the definition, said Stan Dolberg, vice president of marketing at USL. "ACE is more like a collection of companies that see the future in a similar way," he said.

Some already question DEC's long-term commitment to ACE, as the vendor grows closer to producing systems based on its own Alpha RISC chip. The company's Unix line now uses the Mips R3000 chip.

Many analysts said they believe DEC will submit the Alpha chip to ACE as a rival to the Mips R4000 processor. DEC officials insist they remain committed to the Mips chip, despite widespread skepticism.

"We recently sat in a relatively high-level nondisclosure meeting at DEC, and they couldn't explain ACE to us," said Duane Elms, program manager for technical computing at General Electric Co. in Bridgeport, Conn. "What they really care about is Alpha."

Despite the murkiness of its mission, ACE has managed to mark a few milestones on its way to a desktop standard (see chart at left).

Coming up aces?

The following are some of the milestones reached by the ACE alliance since its April 1991 debut:

- **June '91:** Advanced RISC Computing hardware specification issued.
- **Oct. '91:** Mips Computer Systems begins shipping its R4000 chip.
- **Oct. '91:** Unix System Laboratories joins and adds System V Release 4 as a third ACE operating system.
- **Jan. '92:** Microsoft's Windows New Technology application developer's kits begin shipping to software vendors.
- **Jan. '92:** Membership hits 250, including 90 system vendors. ACE begins charging membership fees.

CW Chart: Janell Genovese

Graphic advance

Silicon Graphics, Inc. last week introduced the industry's initial workstations based on Mips Computer Systems' R4000 chip — the first sign that the delay in volume shipments of the third-generation 50-MHz RISC microprocessor has ended.

The R4000 chip is a linchpin for the ACE alliance. Because Mips-based systems are expected to become ACE's RISC desktop standard, the debut of the R4000-based Iris Crimson line "may add some positive reinforcement to ACE," said Nancy Battey, an analyst at International Data Corp.

Priced from $27,900 to $99,900, the single-user deskside systems come in seven models that span the full range of graphics offered by Silicon Graphics. They have a performance rating of 70 Specmarks and will be available later this quarter.

A variety of optional, $2,000 graphics upgrades allow users to better match their graphics needs with the size of the system. "This is the first time SGI has made all of its graphics products available on one system," Battey noted. "That will be a real benefit for users."

MARYFRAN JOHNSON

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Quips & Quotes

"Everything that can be invented has been invented."

Charles H. Duell,
U.S. commissioner of patents in 1899, urging the abolishment of the patent office.

Computer probe yields 13 cents

When George Green, an employee of the Texas Department of Human Services, became a whistle-blower by exposing some problems with agency procurements, the department investigated him and then fired him. Officials made a computer analysis of 8,000 calls Green made on the office phone to see if he did any personal business. They found a 13-cent call to his father in 1987. A Travis County, Texas, jury ordered the state to pay Green $13.5 million in damages — minus the 13 cents.

WORD PLAY

Aliasing: A file by any other name

Palmtops: I see much competition in your future

WYSIWYG

Skip the hoopla A survey of 51 trade show attendees by The Delahaye Group showed that conference goers are beginning to tire of the glamour and want to get back to basics:

- 45% objected to glitz, glamour and pretty faces, instead preferring more technical demonstrations.
- Only 17% said booth graphics were the reason for visiting a booth.
- Attendees spent an average of 11 minutes in the booth.

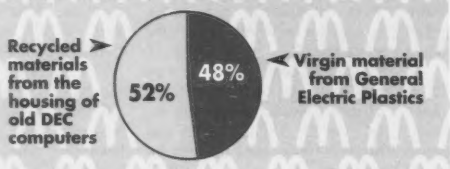
Tech trivia

1. Everyone's heard of Silicon Valley. Do you know the real geographic locations of the following places:
   - **a.** Silicon Prairie
   - **b.** Silicon Mountain
   - **c.** Silicon Valley North
   - **d.** Silicon Glen
2. In what year did the byte become a standard? 1950, 1958 or 1964?
3. What was the first tune generated by a computer, and where was it generated?

Answers: 1a. Dallas; **b.** Colorado Springs; **c.** Portland, Ore.; **d.** Scotland **2.** 1964. The 8-bit byte became a standard with the IBM 360 computer. **3.** "A Bicycle Built for Two" at Bell Labs

Old DEC computers never die, they just ...

Become part of the roof at McDonald's. Recently, workers in Chicago installed roofing panels made from recycled computer housings on two McDonald's restaurants. The panels, made by Nailite Corp., consist of the following:



Fines, bar none

Supermarkets have found that many UPC labels are so poorly printed they can't be read by checkout scanners. So Ralph's Grocery Co. in Los Angeles has decided to levy fines against suppliers whose bar codes cause mis-scans. The first bad scan results in a warning, the second nets a $500 fine, and subsequent offenses cost $1,000.

For Trekkies only

Statx, an antistatic spray for computers and faxes, has as its spokesman Lt. Worf, chief of security on the starship Enterprise. "With Statx," Worf says, "dust can't cling on to high-tech surfaces." Why Lt. Worf? He should know. He's a Klingon.

WYSIWYG design: Marie Haines. Photo: Shooting Star.

► Do you have anecdotes about your users, your boss or your job? Know any industry trivia? If so, please contact Lory Zottola or Jodie Naze at (800) 343-6474. If we use your ideas, we'll send you a gift.

Sources: *Journal of Light Construction* (December 1991); *ID Systems* magazine (December 1991); *The National Law Journal* (Jan. 20, 1992); *Profiting from Innovation* (The Free Press, 1991); "Word Watch," The Delahaye Group.

INSIDE LINES

Microsoft not invited

► It's not a UN summit or anything, but tomorrow Lotus, Apple, Novell and Borland are scheduled to hold a joint press conference in California to discuss their united support for Lotus' Open Messaging Interface messaging standard. Apple and IBM have already backed the emerging standard; this would be the first time that Borland and Novell have formally joined the party.

30 days hath April . . .

► It seems like some IBM programmers forgot that age-old bromide when developing Release 4.2 of the Resource Management Facility, a mainframe software package that collects statistics about computer use and then prints out reports. In an attempt to deal with the leap year, the new RMF release apparently mixed up the number of days for January and February, allowing only 29 for the former and 31 for the latter. Thus, all reports are two days off, beginning on Jan. 30. "IBM's gonna get a lot of calls on this one," one user said.

Alpha, beta, alpha

► DEC customers can expect Alpha VAX's coming-out party during the third week of February. The debut will likely include a preview of possible systems configurations and may possibly extend to pricing and intended delivery dates. The first product will be a workstation delivering 80 VUPS, priced below $20,000. Code-named Flamingo, the workstation may see the light of day during the second half of this year.

D-day approaches?

► A total of 1,300 IS people will reportedly lose their jobs during the next 12 months as part of an effort to "eliminate redundancy" at Aetna Life & Casualty. Soon after implementing Consistent Office, an early 1991 reorganization plan to gain control of its chaotic, unstandardized IS department, the insurer cut 2,600 workers companywide. So far, so bad, sources said. "Corporate IS was a tiger without teeth" before the changes and still is, one insider said. Aetna execs refused to comment on any upcoming personnel changes. "Check back in three to four weeks," a company spokesman said.

Opening the nasal nodes

► Network General is scheduled this week to enhance its remote Sniffer to be able to sniff out Novell Netware problems on both remote Ethernets and Token Rings on the same console by using Novell's IPX to talk to both. The existing product supports TCP/IP for Ethernet and Netbeui for Token Ring. "Right now, you can't even use Novell's Lantern to talk to Novell networks via IPX routers because Lantern doesn't run IPX," a Network General spokesman said.

Bogging down

► NCR Corp. is readying a handheld pen-based system that some observers say will ship by the end of April. But analysts say NCR will be unable to produce these systems — or its System 3125 notepad, for that matter — at prices low enough to be competitive in the marketplace.

Strike three?

► While the major league baseball community is up in arms that Japan's Nintendo is interested in buying the beleaguered Seattle Mariners, some people in the local business community have turned to favorite son and Microsoft founder Bill Gates to buy the team and keep it an American enterprise. Gates has reportedly nixed the idea.

Lotus is going to extraordinary lengths to solve its well-known "perception problem." After signing up McGlinchey & Paul to help buff its tarnished product image, the spreadsheet giant is now said to have under consideration a plan to hire New York PR powerhouse Sawyer/Miller to help articulate its "innovation story." Don't forget, the company also has an internal PR staff and works with flack firm Alexander & Associates. With all that firepower, no telling how much puffery is gonna come out of Cambridge in the months to come. News Editor Alan Alper knows how to separate the wheat from the chaff. Phone, fax or Compuserve him at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively.

Last time, it was the experts' choice. This time, it's the easy choice.

The new IRMA WorkStation for Windows 1.1

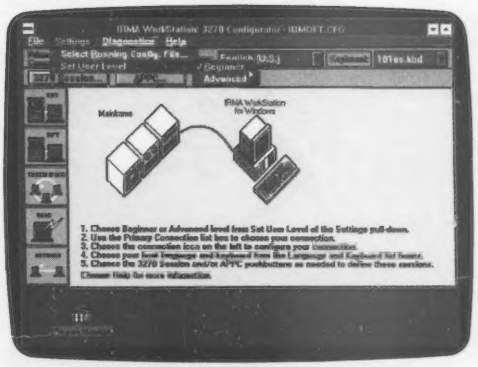
From the very beginning this 3270 emulation software was the No. 1 choice of experts like the editors of *PC Magazine*. It brought a host of sophisticated features into the wonderful world of Windows™ connectivity. But it was only the start.

PC MAGAZINE EDITORS' CHOICE
February 26, 1991
IRMA WorkStation for Windows, Ver. 1.0.

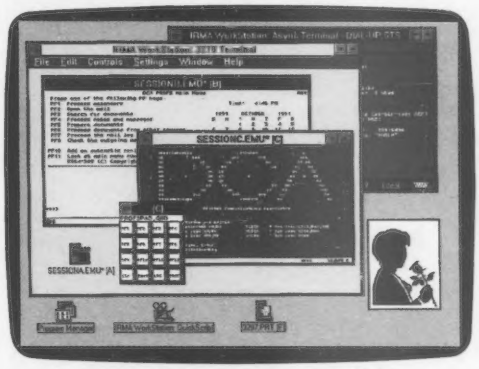
Now, we've made IRMA™ WorkStation for Windows so incredibly simple to install and operate, that it's the easy choice for anyone!

The new 1.1 version virtually installs itself. Instead of asking endless questions during "SETUP", it senses your communications adapter and then pre-configures the software accordingly. Say you have an IRMA 3* Convertible coax card. With the "Intelligent User Assist" program it will automatically pre-configure the CUT and DFT connections. If you have an IRMAtrac™ token-ring adapter, it will pre-configure a token-ring connection.

Once installed, our new software is easier to operate, too. Using the familiar Windows Multiple Document Interface (MDI), you get the easy efficiency of managing multiple sessions with a single menu bar.



Installation couldn't be easier! The new Intelligent User Assist automatically senses the communications adapter in your PC. A Configurator Screen shows your PC and its connection to the mainframe.



Multiple Document Interface (MDI) lets you manage multiple communications sessions with a single menu bar in the main 3270 terminal emulation window.

Integrating mainframe data into your other Windows applications is no problem either. You'll find a breadth of application integration tools like macros, QuickScript™ with DDE, HLLAPI and APPC.

Just as important, with this IRMA software package, you can get into "Windows" connectivity no matter how you're connected. There's CUT, DFT, SDLC, token-ring and asynchronous connections. And what's more, IRMA WorkStation for Windows can now even act as client software for DCA*'s IRMALAN™/*EP* 3270 NetBIOS gateway. No one offers as many connectivity options!

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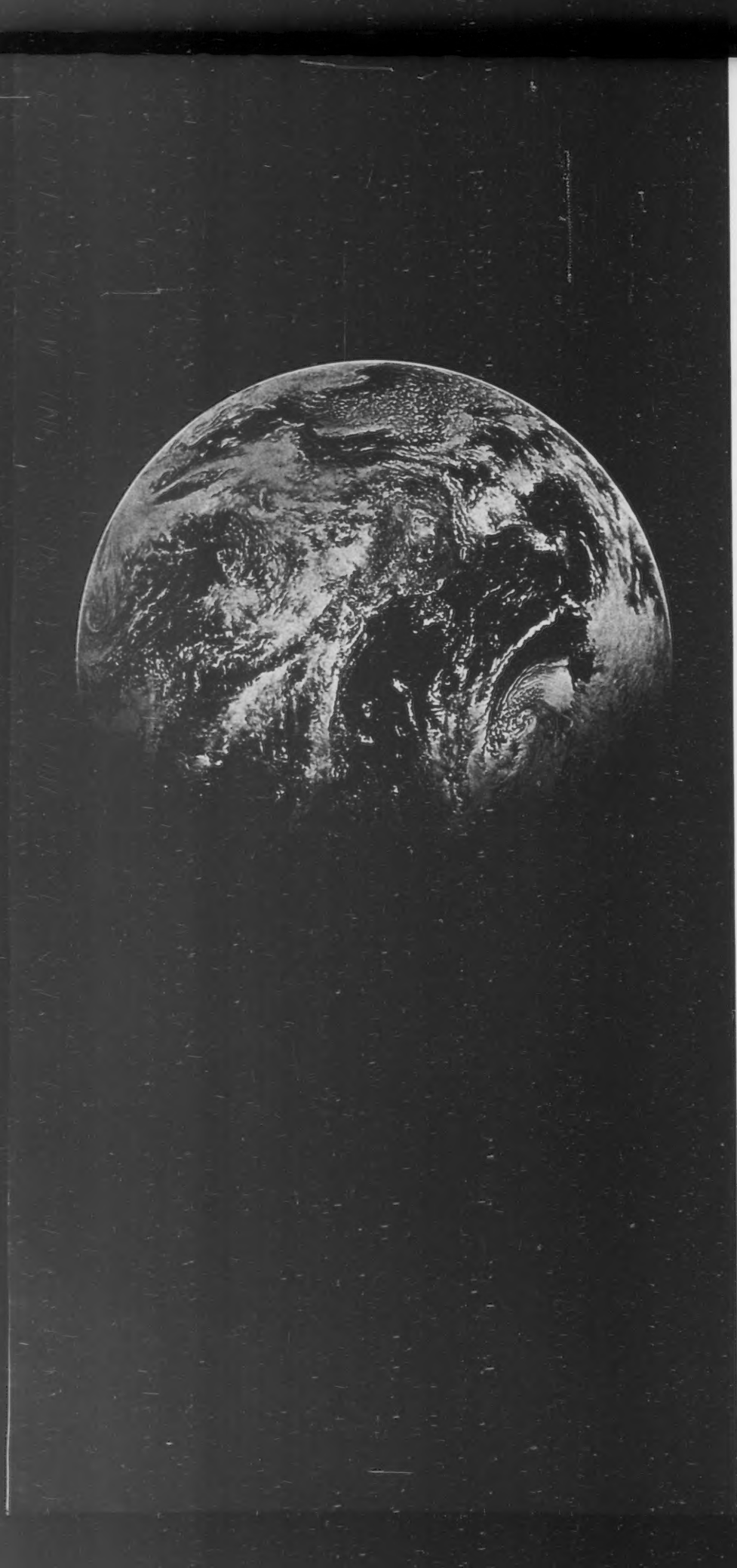

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